FAA Aviation News

SAFETY FIRST FOR GENERAL AVIATION

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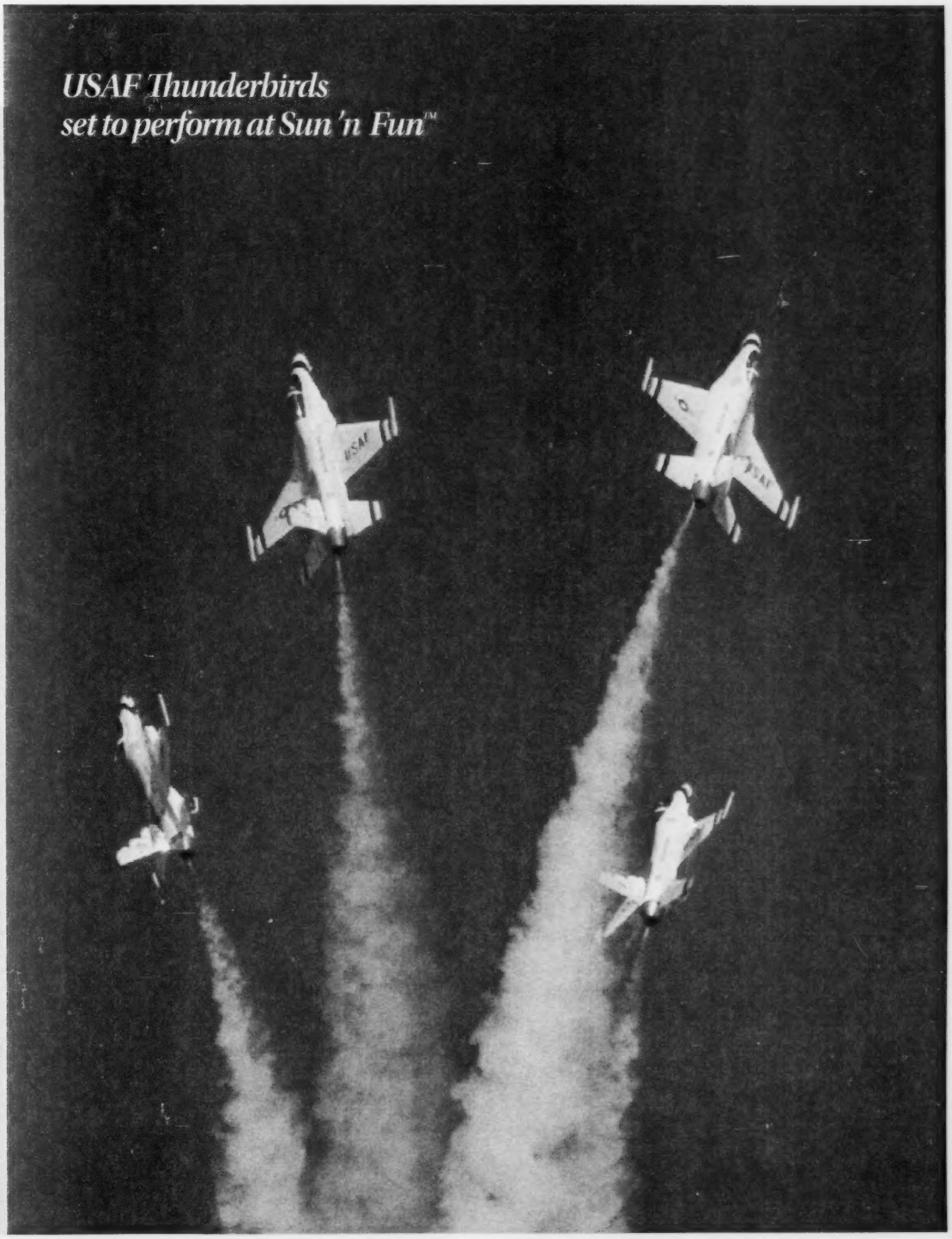
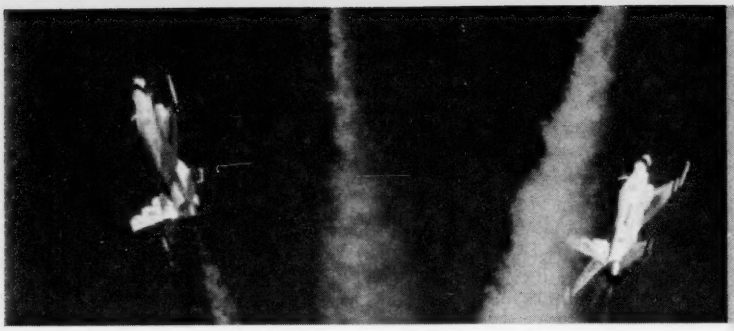


USAF Thunderbirds set to perform at Sun 'n Fun™



About the Cover: *This classic maneuver of the U.S. Air Force "Thunderbirds" will be one of many seen during their performances at Sun 'n Fun™ this year.*

Official U.S. Air Force photo

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The FAA's Flight Standards Service, General Aviation and Commercial Division's Plans and Programs Branch (AFS-805) publishes *FAA Aviation News* six times each year in the interest of aviation safety. The magazine promotes safety by discussing current technical, regulatory, and procedural aspects affecting the safe operation and maintenance of aircraft. Although based on current FAA policy and rule interpretations, all material herein is advisory or informational in nature and should not be construed to have regulatory effect.

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Jumpseat

JAMES J. BALLOUGH
DIRECTOR, FLIGHT STANDARDS SERVICE

Safety Begins With You

Welcome to *FAA Aviation News*, a bimonthly publication produced by our General Aviation and Commercial Division. The first issue of *Aviation News* came out in January 1961 in order "to acquaint readers with the policies and programs" of the FAA.

In those early days of the magazine as well as of the FAA, an editorial in that first issue summed up the agency's approach to its regulatory role. It said that, "FAA's underlying philosophy in the area of enforcement can be summed up in a phrase: Willing compliance."

Every regulator wants "willing compliance." Yet, FAA has changed over the years and, as we celebrate the agency's 50th anniversary this year, we have come to understand that willing compliance is not enough to ensure aviation safety. It takes communication, cooperation, and commitment from everyone in the system—so we now take more of a collaborative approach with the individuals and entities we regulate and oversee.

Yes, we are aggressive safety proponents, but years of experience have taught us that the surest way to improve aviation safety is through awareness, education, and training. This is exactly the approach we are taking with *FAA Aviation News*. Targeted for the general aviation community, this publication is designed to make you aware of FAA resources, help you understand something that you might not have understood before, and encourage you to seek the training you need for the kind of flying you do. Most of all, we want to stress that you—as pilot or mechanic or instructor—are the keystone to aviation safety.

I hope you notice the improvements in the look and, most importantly, in the contents of *FAA Aviation News*. You will see recurring departments, such as Susan Parson's "Checklist" column. Susan is an Airline Transport Pilot and Certificated Flight Instructor (CFI, CFI-I, MEI) who has also earned Master Flight Instructor and Master Ground Instructor designations from the National Association of Flight Instructors (NAFI). Her passion is aviation education, and she will bring her insight and experience to these pages every issue.

Starting this issue, we introduce a regular "Aeromedical Advisory" column by Federal Air Surgeon Fred Tilton, M.D. Flying safely is inextricably linked to flying healthily. For example, there are over-the-counter medications that are great on the ground for treating the common cold, but that can be deadly when taken to altitude. In these pages, Dr. Tilton will provide important information about such topics as medication, vision, and new developments in aviation medicine, as well as direct you to valuable resources.

In the regular "FAA Faces" column on the last page, we introduce our employees. This month, meet Obie Young, FAA Safety Team Production Manager at the National Resource Center in Lakeland, Florida. Young, who has made countless contributions to aviation safety, is just one of 4,800 Flight Standards employees dedicated to make flying even safer. In addition, we will continue to bring you timely features in each issue, such as the articles on formation flying and experimental flight training in this issue.

Yes, we are aggressive safety proponents, but years of experience have taught us that the surest way to improve aviation safety is through awareness, education, and training.

All of the professionals in the Flight Standards Service are committed to continuous improvement. We want general aviation flying to be enjoyable and safe. Toward that end, we want to make this publication as useful for you as we can and to keep making it better. To do that, we need to hear from you. Please let us know what you want us to feature in the magazine...or what we can do to improve it. You can write to the magazine staff at *FAA Aviation News*, Federal Aviation Administration (AFS-805), 800 Independence Avenue, SW, Washington, DC 20591, or e-mail your comments to AviationNews@faa.gov.

This improved magazine is in keeping with the role of the regulator in the 21st century—providing regulations and oversight, yes, but also providing resources to help everyone fly even more safely—on each and every flight.

Sun 'n Fun™ 2008

Getting There Safely

The dates for the 34th Annual Sun 'n Fun Fly-In™ are April 8-13, 2008.

As the Sun 'n Fun Web site, www.sun-n-fun.org, says,

"The Aviation Year Starts Here."

H. Dean Chamberlain Photo

Held at the Linder Regional Airport (LAL) in Lakeland, Florida, Sun 'n Fun™ is the first large fly-in of the 2008 fly-in/air show season. A special air show highlight this year will be the appearance of the U.S. Air Force Air Demonstration Squadron, the "Thunderbirds." The Thunderbirds make precision formation flying look easy, but as discussed in an article on the art of safe formation flying on page 6 of this issue, it is the result of experience, practice, and adherence to rules and procedures.

As with any flight or aviation event, preparation is the key to making it a safe and successful trip. Remember, the federal aviation regulations require you to become familiar with "all available information" concerning the flight. If you're one of the lucky pilots heading south for flying fun in the Florida sun, you'll find Lakeland Regional Airport (LAL) located between Tampa and Orlando, just south of Interstate 4. To facilitate safety and efficient traffic flows to and from LAL, which is also located between two Class B airspace areas, the FAA will once again establish a special *Notice to Airman* (NOTAM) outlining the special flight procedures in effect at LAL and nearby airports. Once issued, the NOTAM will be available on the FAA's Web site at www.faa.gov. Look for the NOTAMs link under the "Pilots" tab on the FAA Web site. Another source of information is the FAA North Florida Flight Standards District Office in Orlando: http://www.faa.gov/about/office_org/field_offices/fsdo/orl/.

Because of the number and types of aircraft flying to Sun 'n Fun before, during, and after the fly-in, all pilots planning on flying in central Florida during this period need to review and study the NOTAM for critical flight information. For example, it includes the special Instrument Flight Rules (IFR) reservation procedures; temporary control tower information; Special Visual Flight Rules (SVFR) arrival procedures; landing, taxi, and departure procedures for Lakeland; and the different airspeeds and altitudes in use at Lakeland based upon category and class of aircraft and operating/landing areas. The NOTAM lists the hours the Lakeland airport will be closed for the daily air show.

The NOTAM also includes safety notes. For example, plan to have extra fuel onboard in case there are landing delays that require holding or diverting to another airport. Turn your landing lights on within 30 miles of Lakeland to help other pilots see and avoid your aircraft. Review the information about items to bring (e.g., tiedown gear), opening and closing flight plans, special procedures for parking, location of the aircraft parking and camping areas, and hours and locations for weather briefing and flight planning services.

H. Dean Chamberlain Photo

Sun 'n Fun, What To Do Once You Are There

When reviewing the extensive list of activities and programs available to decide which events will let you make the most of your personal Sun 'n Fun experience, be sure to schedule a stop at the FAA Safety Center for its exhibits, forums, and flight services. The FAA Forum Schedule on page 5 lists the industry and FAA speakers currently scheduled to give presentations at the FAA Safety Center.

If you can't stop by the Safety Center, see the presentations live via the Internet at www.faaproductionstudios.com or www.faasafety.gov, and click on the "View Safety Seminars Live" link. Some or all of the presentations may be broadcast on Sun 'n Fun Radio AM 1510. Check again when you arrive, though, since schedules can change!

Because of the thousands of aircraft flying to and from Sun 'n Fun and the need to keep those aircraft moving on the ground after landing or preparing for takeoff, there are also special operating procedures for the Lakeland airport. At a large fly-in, it is vital that everyone follow the appropriate air traffic control guidance and remain alert for aircraft or pedestrians in the area. There will be airplanes and people everywhere, so be vigilant at all times! Review the special taxi instructions, required and recommended aircraft parking signs, and the procedures for when and how to exit the runways.

Once you land, watch for the red/orange-shirted air traffic controllers working the runways and taxiways, as well as volunteers helping to move and direct aircraft to and from parking areas. Don't let your guard down until the aircraft is safely parked and tied down. You will likely taxi through public areas and, although there will be wingtip walkers and volunteers to assist, being pilot in command (PIC) means constantly watching for "conflicting traffic" of all kinds. Be especially alert for aircraft with pilots who don't know or follow the appropriate procedures.

If you are flying the Lake Parker Visual Flight Rules (VFR) arrival procedure, you'll want to pay special attention to the possible increase in activity in nearby areas. These include seaplane activity on Lake Parker during the fly-in, plus increased seaplane activity at the Fantasy of Flight facility located in Polk City, Florida. On Thursday April 10 and Friday April 11, there will be a Seaplane Pilots Association™ "Splash-In" at the facility. These seaplanes can be anything from ultralight vehicles on floats to trikes on floats to large multi-engine amphibians. Fantasy of Flight is located northeast of Lakeland on the north side of Interstate 4.

Finally, be sure to check the effective dates of the NOTAM before you go, since NOTAM special procedures usually take effect several days before the fly-in's official opening. Remember, a little planning can go a long way in making this visit, whether it is your 34th Sun 'n Fun or your first, a great experience.

This Cessna is being led to its tie-down spot by a motorcycle-equipped safety volunteer. Aircraft taxiing to parking pose a hazard to spectators who get too close. Spectators are asked to obey the safety guidance provided by the safety volunteers.

The FAA PRODUCTION STUDIOS at the FAASTeam NATIONAL RESOURCE CENTER

FAA Forum Schedule for Sun 'n Fun 2008

The Aviation Year Starts Here

Time & Date	Tues., April 08	Wed., April 09	Thurs., April 10	Fri., April 11	Sat., April 12	Sun., April 13
0830 - 0930	**The Flight Review** Walt Schamel *2004 ASC of the Year*	**Surviving Forced Landings** Eric Basile	**Accident Investigation for First Responders** Mike Busch *Cirrus Aircraft*	**RNAV: GPS, WAAS and LAAS Approaches** Martin Heller Shelby Wheeler	**Sport Pilot** Larry W. Clymer Van Stumpner *Aircraft Certification*	**Bahamas** Keith Gomez *Flying The Islands Of The Bahamas*
1000 - 1100	**USAF Thunderbirds Safety / Teamwork** Thunderbird	FAASTeam James E. Pyles **The WINGS Pilot Proficiency Program** *FAASafety.gov*	AOPA-ASF Bruce Landsberg **Weather Wise: Thunderstorms & ATC**	**Maintaining Your Medical** Dr. James Fraser *Dep. Federal Air Surgeon*	**Guide to Rotax Aircraft Engine Maintenance** Phil Lockwood	**Single Pilot CRM** Steve Brady
1130 - 1230	FAASTeam Mike Halloran **Personal Safety Risk Management**	FAASTeam Joseph Foresto **CFI/DPE Program**	**The Kings on Practical Risk Management** John and Martha King	AOPA-ASF Bruce Landsberg **Weather Wise: Thunderstorms & ATC**	AOPA-ASF JJ Greenway **Top 5 Mistakes Pilots Make**	FAASTeam
1300 - 1400	**Bahamas** Keith Gomez *Flying The Islands Of The Bahamas*	**SMS, Human Factors and Surface Safety** Dan Cilli *Office of Runway Safety*	**Flight Instruction Professionalism** Sandy & Jo Ann Hill *NAFI* Tom Evans *FAFI*	Meet The FAA Doug Murphy *Host*	AOPA-ASF JJ Greenway **Top 5 Mistakes Pilots Make**	**Mexico** Rick Gardner *Flying Mexico*

The Forum opens daily at 0800

See all these seminars LIVE at http://www.faaproductionstudios.com/ or http://www.faasafety.gov/, by clicking on the "View Safety Seminars Live" link. All or part of some of the presentations are simulcast on Sun 'n Fun Radio AM1510. Check our Web site for updates: http://faaproductionstudios.com/. Look for presentations on ATN, The Aviation Training Network; GETN, The Government Educational Training Network; and FAN, The Florida Aviation Network, on April 8, 9, 10, 11, and 14 at 1130 Eastern. *Meet the FAA will be at 1300 Eastern on Friday, April 11.*

Seaplane Splash-In: Thursday and Friday at Fantasy of Flight
Balloon Launch Briefing: Saturday, 0630
Night Air Show: Friday

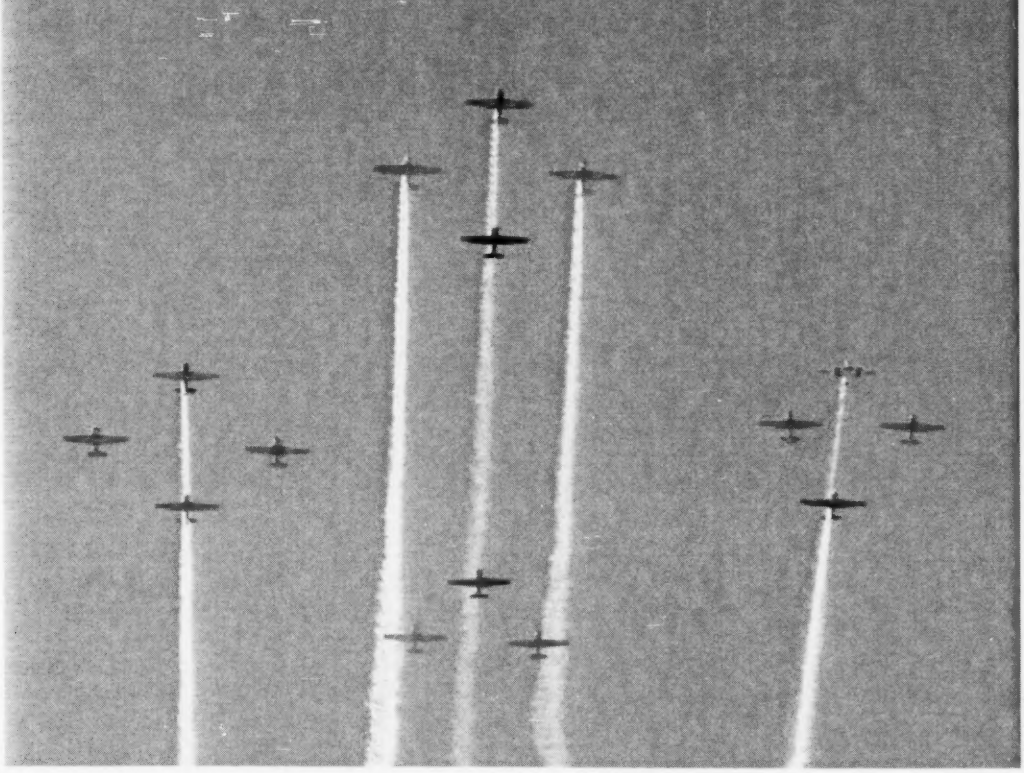
For year round programs and schedules, please see:
http://faaproductionstudios.com/ or http://www.faasafety.gov/.
For broadcast information, please see: http://www.floridaaviationnetwork.com/.

TOM GREGORY III

How Do They Do That?

The Art of (Safe) Formation Flying

Editor's Note: One of the most exciting parts of attending an event like Sun 'n Fun™ is watching the amazing skill of the air show performers. They make it look so easy...but this article makes it clear that safe formation flying takes many years of experience, many hours of regular practice, and strict adherence to established rules and procedures.



Formation flying like this takes skill, training, practice, and discipline to avoid an accident.

Ray Stinchcomb Photo

Let me start with the caution: Please do not try this at home! This article is not intended to be a formation training guide or manual; rather, its purpose is to describe and stress the importance of the elements that contribute to safe formation flight.

First, the basics: Formation flying is truly a learned art. It combines the aspects of good Visual Flight Rules (VFR) pattern work, Instrument Flight Rules (IFR) flying skills, discipline, and good judgment. Just as student pilots are not allowed to solo without meeting the many training objectives stated in the regulations, pilots who wish to be "old" pilots know and completely respect that proper training and evaluation in this dynamic flight regime is essential to safe formation flight.

There are rules for everything in aviation, and air show activities, including formation flying, are certainly included. Title 14 Code of Federal Regulations (14 CFR) part 91 contains pertinent rules regarding careless and reckless operation of an aircraft. But it is 14 CFR section 91.111, Operating near other aircraft, that governs formation flying in the non-air show environment. It requires that no person may operate an aircraft: So close to another as to create a collision hazard; in formation flight except by arrangement with the pilot in command of each aircraft in the formation; or carrying passengers for hire, in formation flight. In addition to these rules, the FAA mandates that pilots flying formation in FAA-waivered airspace, that is, airspace used for air shows, must possess a formation card issued through an approved formation training course. These courses began with type-specific clubs after the advent of the Formation and Safety Team, or F.A.S.T. In essence, civilian warbird operators took over the formation training and certification process from the FAA, which could then focus on observing and rating multi-ship acrobatic acts. The type clubs include a wide range of aircraft: Warbirds, low-wing bubble canopy type clubs, as well as clubs for experimental and standard category aircraft, which are signatories to F.A.S.T. So, there are many opportunities for a pilot who is interested in doing things the right way to obtain proper type-specific formation training with relative ease.

The first quality that a new formation pilot needs is the desire to be a good, steady, reliable wingman. The ability to fly nice, tight VFR patterns that result in consistent approaches and accurate landings can be transferred directly to flying the break-up and rendezvous phase of formation flight. A solid instrument scan can be adapted to include the leader's aircraft and any other wingmen, which is vital to your ability to manage energy, closure speed, and "station-keeping" skill. You might think of this skill set as being comparable to hand-flying the perfect Instrument Landing System (ILS) to minimums.

Arne Graham Photo

Dissimilar aircraft such as this P-51 in trail of a B-17 pose additional challenges when flying formation because of the differences in size, weight, and turbulence.

Although solid flying skills are essential to safe formation flying—and while they are the most visible part of this activity—the single most important component in safe formation flying is the preflight briefing. We have a saying in formation flying that goes like this, "Brief the flight, and fly the brief." Unless you have appropriate training, you will not be able to complete this activity properly, and safety will suffer. I have seen and heard of flights in which a wingman has taken command, making every decision for the lead. This highly unsafe practice shows lack of ground training and discipline. Here's the rule: There can be, and there must be, only one leader in a flight. If the lead is constantly dealing with a troublesome wingman, his responsibilities to the flight will not be met.

If you think that safe practices are applicable only to air show performances, you are mistaken! Safe formation flight practices, starting with the briefing, apply equally to other missions. Many photo flights

have resulted in tragedy due to improper briefings, poor formation skill, and untrained "subject" aircraft pilots. Having a trained formation pilot fly your right seat might save your life. I have flown many multi-ship, dissimilar aircraft type photo missions and have witnessed some of the most frightening displays of poor airmanship imaginable.

Here's another rule: Never attempt formation flying with pilots you do not know or trust. Remember that your life depends upon their skill and discipline. There have been several well-publicized accidents over the past few years involving all phases of formation flying from takeoff to landing. These have resulted in the death and horrific injury to many of our friends, all of whom were trained, current, and proficient. The blink of an eye, the glint of the sun, a cloud of smoke, or the wake of another airplane can all lead to catastrophe. If such things can happen to trained pilots, imagine the danger if a flight of four untrained pilots launches with a minimal briefing for their first big photo mission. Trouble is just waiting for these pilots.

Still another rule: Leave formation landings to the men and women in uniform and the professional air show performers who operate this way as a routine. One of the most respected Warbird four-ship demonstration teams, which has more than 30 years of safe flying, does not include formation landings as a part of its maneuver package. Why would you take such a risk? What is the reasoning for attempting this most hazardous maneuver? Formation takeoffs can be made safe with compatible aircraft, suitable runways, and proper section takeoff procedures and training, but formation landings are a different story. (By the way, a popular examiner question is: Which side of the runway does the lead line up on with a 10-knot direct crosswind from the left? Go get the manual and find the answer!)

Never attempt formation flying with pilots you do not know or trust. Remember that your life depends upon their skill and discipline.

So, what does it take to be a safe formation pilot? First, get the appropriate training. Second, as with all aviation activities, be sure to stay current. All carded, trained, and trusted formation pilots need recent experience to complete a safe formation flight. If you are out of currency, ask an instructor or flight lead for a warm up sortie prior to the actual event. You will not be chastised or turned down for utilizing this sound judgment.

All formation flight examiners love to ask thought-provoking questions. Can you answer these? How are you going to:

- Effect the initial join up?
- Change positions in a four-ship formation?
- Communicate with lead and wingmen?
- Rejoin after lost sight?
- Gain wingman separation for landing?
- Manage speed and power settings?
- Safely land and clear the runway as a flight?
- Execute a go around?

A pilot who cannot confidently and correctly answer every one of these questions is in for a scary day of flying. Adding a pilot who is not trained, or who won't accept the need for a recurrent training sortie, can raise the risk factors to an unacceptable level. The flight leader has the responsibility to the rest of the flight team not to let this happen. Proper training reduces risk and allows the leader to concentrate on his job, which includes communication, navigation, traffic watch, and weatherman.

After a successful formation flight, never skip the debrief, which can be one of the most important safety and educational parts of the flight. With proper training and execution of the formation flight, these debriefings can be pleasurable and a great learning experience.

One last thought: I have a philosophy that was instilled in me from the start of my professional flying career more than 27 years ago in Pensacola, Florida. If you have my business card, turn it over. It reads: "FLY SAFE, FLY SMART, GET THE TRAINING FIRST." These are words to fly by, and they are words to live by. Please have fun, but never attempt flying formation without proper training to operate safely in this challenging flight regime.

Tom Gregory III is a former Marine aviator. He is also a designated pilot examiner, experimental/specialty examiner, U.S.A.F. Heritage Flight Pilot, F.A.S.T. formation check pilot, flight museum chief pilot, and is currently a B727 Captain for a major airline.

ROGERS V. SHAW, II

Defeating Dehydration

Keeping Cool in the Florida Sun

In the heat of the day, airplanes may provide the only shade in the aircraft tie-down area.

In warmer weather, dehydration can be a serious problem for not only those in the air, but also for those on the ground. When attending aviation events such as Sun 'n Fun™, keeping your cool means being aware of signs that signal the onset of a potentially serious problem. This article is one of the safety topics found at http://www.faa.gov/pilots/training/airman_education/topics_of_interest/.

Along with the excitement and fun, events such as Sun 'n Fun™ include plenty of opportunities for dehydration: Think hot cockpits and flight lines, wind, humidity, diuretic drinks (such as coffee, tea, alcohol, and soft drinks), changes in climatic conditions, sunburn, and improper attire. These can lead to some of the common signs of dehydration or heat exhaustion: headache, fatigue, cramps, sleepiness, and dizziness.

Proper fluid intake for body hydration is important for safety in flight, because dehydration can put you at increased risk for incidents and accidents. This article offers suggestions for avoiding the problem, but, bear in mind, we are all physiologically different and you will need to make adjustments for your particular circumstances.

Here, in checklist form, are the three stages of heat exhaustion. Transition from one to the other can be very evident, hardly noticeable, or not evident at all.

Stage 1: Heat stress (body temperature of 99.5-100° F) reduces:

- Performance, dexterity, and coordination
- Ability to make quick decisions
- Alertness
- Visual capabilities
- Caution and caring

Stage 2: Heat exhaustion (101-105° F) symptoms:

- Fatigue
- Nausea/vomiting
- Giddiness
- Cramps
- Rapid breathing
- Fainting

Stage 3: Heat stroke (greater than 105° F) symptoms:

- Body's heat control mechanism stops working
- Mental confusion
- Disorientation
- Bizarre behavior
- Coma

To help prevent dehydration, the general guideline is to drink two to four quarts of water every 24 hours. Most people are aware of the eight-glasses-a-day guide: If each glass of water is eight ounces, then you end up with 64 ounces, which is two quarts.

Flight safety seminars always stress situational awareness. Maintaining awareness of your personal health situation is no less important. In fact, it is the key to preventing dehydration. Here are a few key facts:

First, most people become thirsty with a 1.5-quart deficit, or a loss of 2 percent of total body weight. This level of dehydration triggers the "thirst mechanism." The problem, though, is that the thirst mechanism arrives too late and is turned off too easily. A small amount of fluid in the mouth will turn this mechanism off and could delay the replacement of needed body fluid. Remember, the amount of water you need to drink depends on work level, temperature, humidity, lifestyle, and individual physiology.

Second, be aware that you can progress to heat exhaustion, even if you are maintaining the recommended water intake. Under certain conditions, external fluid intake simply cannot keep up with the loss of fluid by the body.

Here are some suggestions on how to be aware of and prevent heat exhaustion:

- Drink cool (40° F) water (forget the old "sports day" theory that lukewarm water is absorbed faster into the system).
- Carry a container so you can measure daily water intake.
- Don't rely on the thirst sensation as an alarm. Stay ahead. If plain water seems too dull, add flavoring to make it more acceptable.
- Limit your daily intake of caffeine and alcohol (both are diuretics and stimulate increased production of urine).
- Monitor personal effects of aging, recent illness, fever, diarrhea, or vomiting.
- Monitor your work and recreational activity. If you feel light-headed or dizzy, call it a day.

Remember, too, that exercise can cause a large amount of body fluid loss that is difficult to replace quickly, and that acclimation to a major change in weather takes one to two weeks. In extreme heat and exercise conditions, salt and electrolyte loss is a factor, but not for the average person with a moderate exercise program.

Fly safe, and never pass up an opportunity to have a fresh glass of water.

Rodgers V. Shaw, II, is the team coordinator of the Civil Aerospace Medical Institute's Aerospace Medical Education Division's Airman Education Program.

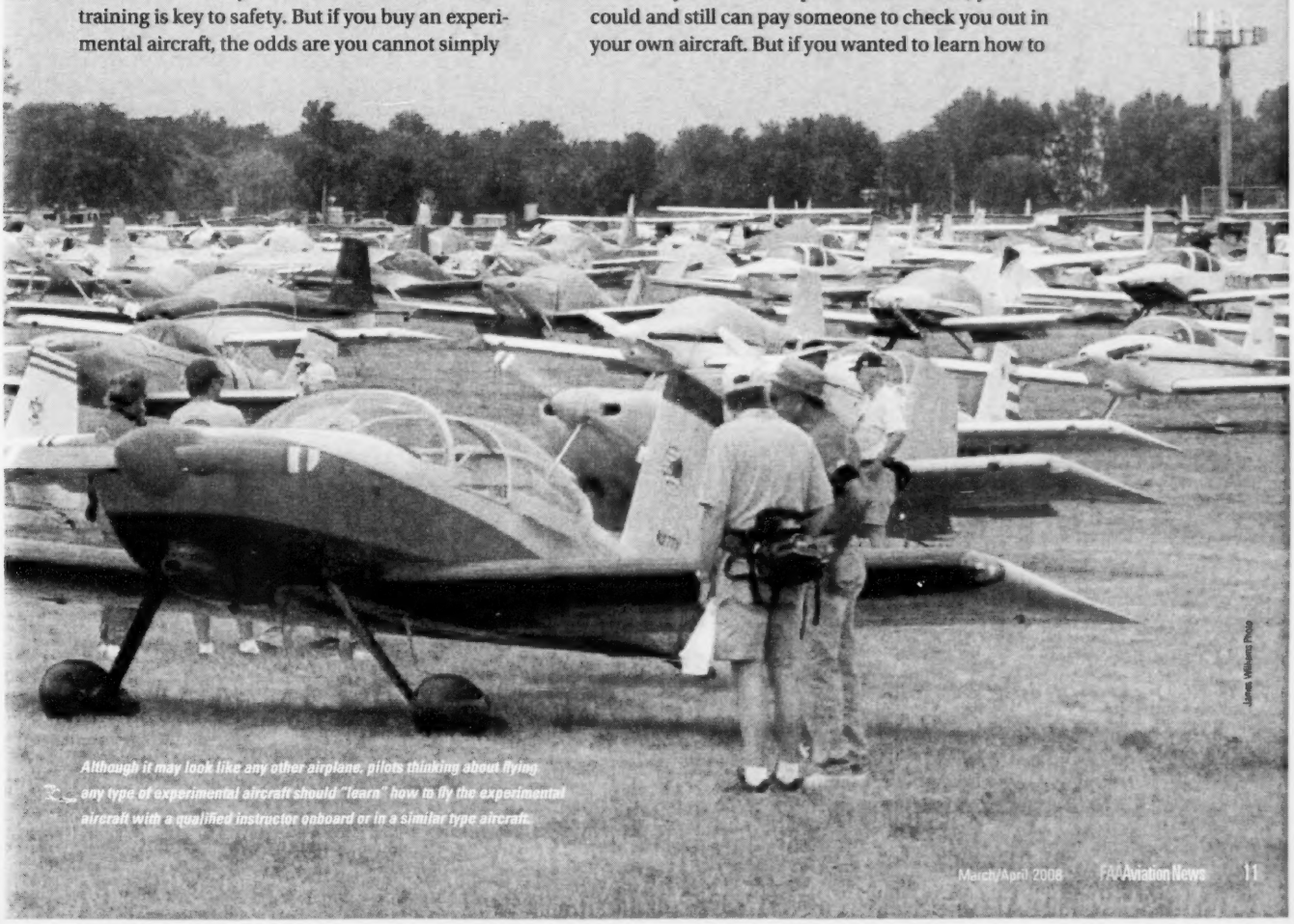
H. DEAN CHAMBERLAIN

Experimental Flight Training for Hire or Compensation

For many, the annual Sun 'n Fun Fly-In™ is the unofficial start of the year's air show and fly-in season. One of the things that makes Sun 'n Fun interesting is it is the first large gathering of experimental aircraft each year. With thousands of pilots anxious to meet all types of new and interesting aircraft, including all of the experimental aircraft being exhibited and flown, chances are good someone will want to buy an experimental aircraft or an experimental kit.

As with any new or unfamiliar aircraft, training is key to safety. But if you buy an experimental aircraft, the odds are you cannot simply go to your local flight school and get checked out in your specific make and model of experimental aircraft. Section 91.319(a) of Title 14 Code of Federal Regulations (14 CFR) prohibits the carriage of persons or property for compensation or hire in aircraft having experimental certificates. Under the rule, a passenger or a "student trainee" is considered a person. So how can you get the safety training you need in an experimental aircraft when the regulations prohibit you from buying the training?

If you own an experimental aircraft, you could and still can pay someone to check you out in your own aircraft. But if you wanted to learn how to



James Williams Photo

Although it may look like any other airplane, pilots thinking about flying any type of experimental aircraft should "learn" how to fly the experimental aircraft with a qualified instructor onboard or in a similar type aircraft.

fly an experimental in someone else's experimental aircraft for compensation or hire, that operator would have to have an exemption from the rule to be able to charge you for the flight training. As you may know, it was once possible for the FAA to issue an exemption allowing you to pay someone to teach you how to fly a specific make and model of experimental aircraft, using that person's aircraft.

Where Should You Look For Training?

Many of the current experimental kit aircraft manufacturers have Internet Web sites that provide make and model information. Another good source is a make and model type club. If a type club exists for your make and model aircraft, it should be searchable on the Internet. Some make, model, or category clubs provide lists of available instructors.

Once you find someone interested in providing make and model training, either in that person's aircraft or your aircraft, you need to make sure that person is qualified, current, and competent in the make and model. If you are using that person's experimental aircraft and you are being charged for the training, ask that person to show you his or her Letter of Deviation Authority (LODA). To be issued a LODA, the instructor had to develop and submit a complete training package to the FAA. You should expect the instructor to use an FAA-accepted training program to ensure the quality of your training. You may also want to ask the instructor for references, such as former trainees, so you can contact them for their evaluation of the instructor.

It is your training, and your money. Use both wisely.

On October 31, 2007, however, the FAA stopped issuing these exemptions. The reason for this is a new rule, 14 CFR section 91.319(h), that says, in part, that:

"The FAA may issue deviation authority providing relief from the provisions of paragraph (a) of this section for the purpose of conducting flight training. The FAA will issue this deviation authority as a letter of deviation authority."

Deviation requests are submitted to the Flight Standards District Office responsible for the geographic area where the aircraft is based.

FAA Notice 8900.15, available on the FAA Internet Web site, www.faa.gov, explains the process. The notice states, in part:

"Training deviations will be issued only for training that cannot be conducted in aircraft holding standard airworthiness certificates. Training such as aerobatics, tail wheel transition, or high performance/complex transition can be conducted in aircraft holding standard airworthiness certificates and are therefore not acceptable. Acceptable training is:

(1) Experimental aircraft specific make and model initial training.

(2) Experimental aircraft specific make and model recurrent training.

(3) Jet unusual attitude and upset training.

(4) Aircraft specific instrument competence training.

(5) Experimental aircraft specific make and model flight review training.

(6) Experimental aircraft specific make and model formation training.

(7) Other specific training approved by the General Aviation and Commercial Division, AFS-800" [Editor's Note: Flight Standards Service, Washington Headquarters]

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Checklist

SUSAN PARSON

Getting Around on the Ground

It had been a near perfect autumn night flight from my non-towered home airport to a larger, towered airport 150 nautical miles (NM) to the southwest. The new Wide Area Augmentation System (WAAS) enabled Garmin GNS 430 offered precise guidance, including an advisory glideslope that smoothly guided me down the final approach course. The tower frequency was quiet, with only a couple of aircraft sharing the skies. I was even happy with the landing. But the perfect flight wasn't over yet, and its perfection was about to be marred by a minor misunderstanding about getting around on the ground.

I had already advised the tower of my intent to land, pick up an Instrument Flight Rules (IFR) clearance, and head straight back home. With that in mind, I expected instructions to exit the runway, taxi back via the parallel taxiway, and advise when ready to copy my clearance. After all, that's how it worked on my last trip to this airport. As the aircraft decelerated on the runway, the tower controller instructed me to take the next exit on the left and hold short of Golf (designation for the taxiway parallel to the landing runway). No sweat, or so I thought. As I have been taught, I "dashed across" the dashed lines on the runway holding position marking and turned to confirm that the entire aircraft was clear of the two solid lines, i.e., to verify that I was, in fact, completely clear of the runway. Before I could turn my head back to establish my position relative to taxiway Golf, the controller's raspy voice issued a rebuke: "Well, so much for holding short of Golf; now, you're on my taxiway. Turn left, taxi back via Golf, and stay with me."

My passenger—also a pilot—and I exchanged puzzled glances and shrugs: Where did we go wrong? There was no intermediate holding position marking on the short "stub" taxiway leading off the runway and, in the dark, it wasn't easy to see exactly where we were relative to taxiway Golf. The only certain thing was that we were completely clear of the solid double lines of the runway holding position marking, which we both believed was the correct and, indeed, the "obvious" thing to have done.

The story ended uneventfully: We taxied back, picked up our clearance, and headed for home. During the quiet return flight, we indulged in some admittedly self-righteous fulminating about how that grumpy controller didn't give us credit for clearing the runway, and (in our view) gave us hold-short instructions that we could not possibly obey without being legally still on the runway.

No sweat, or so I thought. As I have been taught, I "dashed across" the dashed lines on the runway holding position marking and turned to confirm that the entire aircraft was clear of the two solid lines, i.e., to verify that I was, in fact, completely clear of the runway.

I was absolutely sure I was right to have fully crossed the runway holding position marking, but this blemish on my otherwise "perfect" flight bothered me enough to spur a search of the *Aeronautical Information Manual* (AIM) for information to confirm the righteousness of my position.

Oops.

Maybe my position wasn't so righteous after all. Here are the key elements of the guidance i found in AIM 4-3-20, which covers "Exiting the Runway after Landing:"

> b. Taxi clear of the runway, *unless otherwise directed by ATC* [*emphasis added*]. An aircraft is considered clear of the runway when all

parts of the aircraft are past the runway edge and there are no restrictions to its continued movement beyond the runway holding position markings. *In the absence of ATC instructions, the pilot is expected to taxi clear of the landing runway by taxiing beyond the runway holding position markings associated with the landing runway, even if that requires the aircraft to protrude into or cross another taxiway or ramp area.* [*emphasis added*]. Once all parts of the aircraft have crossed the runway holding position markings, the pilot must hold unless further instructions have been issued by ATC.

One way to get the most from your hard-earned tax dollars is to take advantage of the many resources available on this part of the FAA's Web site www.faa.gov/runwaysafety/

Even more sobering were the AIM notes associated with this section, which read as follows:

1. *The tower will issue the pilot instructions which will permit the aircraft to enter another taxiway, runway, or ramp area when required.*
2. *Guidance contained in subparagraphs a and b above is considered an integral part of the landing clearance and satisfies the requirement of 14 CFR section 91.129.*

What Else Am I Missing?

I was lucky, as this incident was a "no harm, no foul" situation that wounded nothing more than my pride. I was also lucky in that it provided the motivation for a much-needed and long overdue review of the many runway safety resources available to pilots nowadays. Most are as close as a click on the right URL. Let's take a look.

FAA Office of Runway Safety One way to get the most from your hard-earned tax dollars is to take advantage of the many resources available on this part of the FAA's Web site www.faa.gov/runwaysafety/ (see Figure 1). An interesting place to start is the link on the lower right, called "Situational Awareness Through Airfield Signs & Air Traffic Control Instructions" (see Figure 2).This interactive exercise lets you test your ability to maintain situational awareness of your location on the field, how that location relates to your intended taxi route, and to other aircraft and vehicles operating on the field with you. You have the option to download a taxi diagram, and at different points on your taxi route, the program asks you questions about airport signage and interpreting ATC instructions. This exercise provides a fun way to review, as well as a safe way of finding where the gaps in your knowledge might be.

Clicking on the site's "Test Your Knowledge" link, www.faa.gov/runwaysafety/knowledge.cfm,

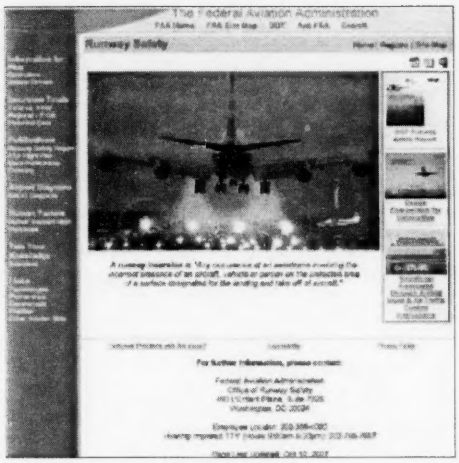


Figure 1: This Runway Safety Web site provides information, exercises, and links about runway safety issues.

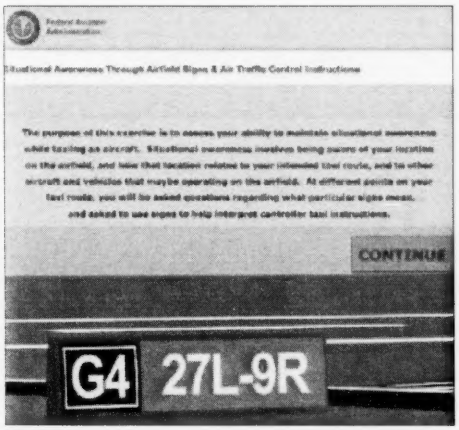
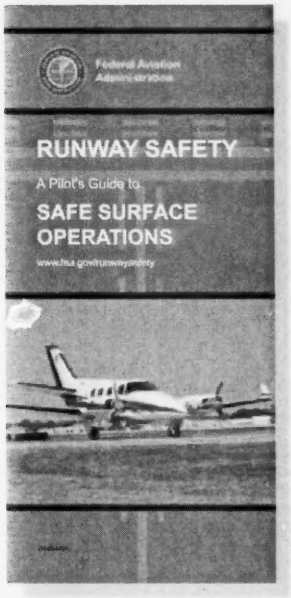


Figure 2: This is the continuation screen you will see after you download and start the exercise "Situational Awareness Through Airfield Signs & Air Traffic Control Instructions." You can link to the exercise by clicking on the lower right icon of the Runway Safety page.

Figure 3: This pilot's guide to safe surface operations should be in every pilot's flight bag. If you are planning on flying to an unfamiliar airport or to one more complex than your home airport, it can help prepare you for the flight.



brings up another set of interactive runway safety exercises. The "Airport Taxiway Marking Review" allows you to assess your understanding of some of the airfield markings you are likely to encounter while taxiing. The "Taxi Instruction Self-Assessment" exercise allows pilots to assess their understanding of "taxi to" instructions from air traffic control. There are also "Situational Awareness" scenarios, complete with explanations and hyperlinks to a number of documents and resources.

If it's text you're looking for, the FAA's Office of Runway Safety Web site offers that in abundance, too. There are links to a number of runway and ground safety publications. These include advisory circulars related to runway safety, a pilot's quick reference guide to airport signs and markings, links to relevant sections in the AIM, and even a downloadable video on airport signs, markings, and procedures.

This Web site is also a great source of new information, such as guidance on taxi-into-position-and-hold (TIPH) procedures, as well as a notice amending the required phraseology for issuing aircraft departure instructions. Did you know, for example, that controllers are now required to state the runway number first, followed by the takeoff clearance? Or, that if takeoff clearance is issued before the aircraft crosses all intervening runways, the number of the runway(s) to be crossed will be stated along with the takeoff clearance? Do you know about the FAA's Runway Incursion Information Evaluation Program (RIIEP)? Through RIIEP, the FAA seeks information on runway incursions by interviewing pilots involved in such events. Pilots who cooperate are generally not subject to enforcement action. The goal, of course, is to use this information to help identify causal factors in runway incursions and develop better ways to avoid them. Finally, coming soon to this Web site is an updated version of the FAA's informational pamphlet called "Runway Safety: A Pilot's Guide to Safe Surface Operations" (see Figure 3).

FAASTeam The FAA Safety Team's Web site, www.faasafety.gov, has additional resources, including presentations and information on runway safety seminars, available to all pilots. The site's search function will help you locate events and documents based on keywords, and you'll want to check back often. New material is being added to the site all the time.

AOPA Air Safety Foundation One of the links on the FAA Office of Runway Safety Web site goes to an interactive runway safety course, developed jointly by the FAA Office of Runway Safety, the Aircraft Owners and Pilots Association (AOPA), Air Safety Foundation (ASF), and the Air Line Pilots Association (ALPA). The ASF site offers a number of other runway safety tools and resources as well. For example, check out the Runway Safety Flash Cards, which you can download from www.aopa.org/asf/publications/flashcards/index.html. The ASF's other ground safety-related publications include "Operations at Non-towered Airports," www.aopa.org/asf/publications/sa08.pdf, and "Operations at Towered Airports," www.aopa.org/asf/publications/sa07.pdf.

These are only a few of the many excellent resources at your fingertips. Check it out, and don't let problems getting around on the ground mar your otherwise "perfect" flights!

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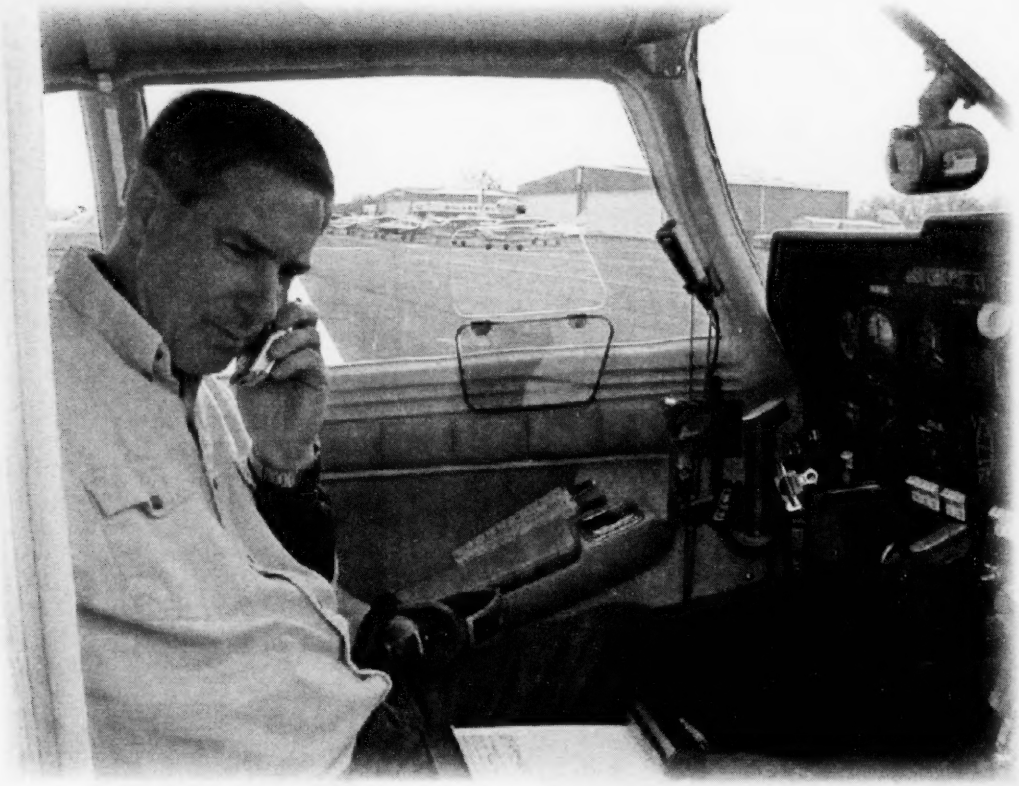
JEFF SPONBERG

Pilot In Command on the Ground



Susan Parson Photo

One way to avoid runway incursions and other types of incidents is to make your Flight Service telephone calls and to arrange your flight plans and appropriate charts before you start your engine.

We are all familiar with the term "pilot in command" (PIC) and—at least in theory—we understand that when the rules (Title 14 Code of Federal Regulations section 91.3) say that the PIC is directly responsible for the operation of the aircraft, it means "all" operations. Still, pilots may not give a lot of conscious thought to taxiing an airplane on the ground. After all, it is a "routine" part of every single flight. But even though taxiing does not require extraordinary skill or judgment, it *does* require undivided attention to detail and procedure—especially if we are to reduce the frequency of runway incursions at our nation's airports. Remember that it takes just one moment of distraction, inattention, or breakdown in communication between a pilot and controller to turn a routine trip to the runway into a runway incursion or, in other cases, a runway excursion.

No pilot is immune. Since these unintentional pilot *faux pas* occur every single day, each of us needs to examine our established habits and behaviors, and ask whether we have become even the least bit complacent. As objectively as possible, examine what you do and how you do it when you're in the left seat. This simple act just might give you a new perspective on a routine task, and you might discover something new or different, or perhaps validate the way you do things now. Here are a few tips to consider as you conduct your own review.

Single Pilot Operation

Life is very different when you operate as a single pilot rather than as part of a crew environment. You are the pilot, navigator, and sometimes flight attendant. You *are* the flight crew and, since you have only one brain and two eyes, you have to plan how to manage your workload, including your workload on the ground. You have to allocate specific times to execute specific preflight tasks, and there has to be an appropriate time and place for each one.

As pilot in command, you have to aviate, navigate, and communicate all by yourself. A flight crew can share these preflight responsibilities, but in single pilot operations, the burden is yours and yours alone. If you normally fly as part of a crew or with another qualified pilot on board, thinking and planning ahead for each part of the flight, which always begins and ends with taxiing, is even more important, since your habits and routines will all be associated with something other than single pilot operations. In single-pilot operations, you have to work smart and be sure you have all your ducks in a row.

Be Prepared

For any flight, whether single pilot or crew, be prepared. Don't even think about starting the engine until you have all of your charts, pencils, flight logs, computers, etc., ready for the flight and easily accessible—not in a flight bag on the back seat. Pre-start is the best time to fold your charts to the correct panel and to set up everything you will need on a lap desk, kneeboard, or clipboard. Organize each item to be ready in the order that it will be used.

Plan Ahead, Work Ahead

A well-known aviation aphorism is to never let the airplane go anywhere your brain hasn't reached at least two minutes earlier. The pre-start time provides the reconnaissance and information-gathering opportunity that you need in order to stay ahead of the airplane. Make sure you have an airport diagram for the departure airport readily available—it is, after all, your roadmap to the runway. Take a moment to study this "runway roadmap," especially if you are on an unfamiliar field. Mark your current location right on the diagram, and then listen to the automatic terminal information system (ATIS) to determine runway(s) in use, which taxiways are closed, and any construction projects or other special conditions that could affect your taxi route. Armed with this information, you can study the airport diagram at your leisure and determine the possible routes to the runway. An added bonus, especially in this time of sky-high fuel prices, is the ability to review without running the engine.

Complete all of the pre-taxi items on the checklist before you call ground control. Don't press the mike button without having your pen and paper at hand, so you can efficiently record your taxi instructions, including any runway crossing or hold short restrictions. Jot down the phonetics of the taxiway route in a legible shorthand, but get it all so that you don't have to rely on notoriously faulty human memory for every single thing. Read back the instructions to the ground controller in the same sequence, and plant a mental red flag in your mind

anytime you receive runway crossing or hold-short instructions. Promptly request clarification of any instructions you don't understand.

Avoid Multi-Tasking

When you're on the move, most of your attention needs be focused outside the cockpit. So don't release the brakes until you have the communication and navigation radios set. Modern avionics—especially those in glass-cockpit airplanes—require a lot of heads-down time, so do all the dialing, pushing, twisting, and programming chores when the airplane is not moving. Taxiing is inherently a dynamic activity, and heads-down multi-tasking sharply detracts from situational awareness. Keep your attention on what's happening outside the airplane. If you focus exclusively on taxiing, you will have a higher degree of situational and positional awareness, and you will more easily recognize signs and markings. This is an especially important practice during periods of darkness or low visibility.

We have put a lot of emphasis on avoiding runway incursions, in which you inadvertently intrude on another aircraft's temporary right to exclusive use of the pavement. But remember that multi-tasking during taxi can also lead to taxiway or runway "excursions"—incidents in which the airplane ends up in the grass off to the side, possibly with bent metal. While such incidents are usually more embarrassing than fatal, they are very expensive in the way of bruised egos and higher insurance premiums.

Maintain a Sterile Cockpit

Another tip for being PIC on the ground is to maintain a sterile cockpit. Explain to your passengers that taxiing is a busy time, and that preflight duties require your undivided attention. Maintain a sterile cockpit on the ground and realize that passengers can be a huge distraction. Many small items in taxi operations could easily be overlooked or forgotten if you are busy talking to your passengers. Don't let anyone divert your attention from the essential task of steering the airplane.

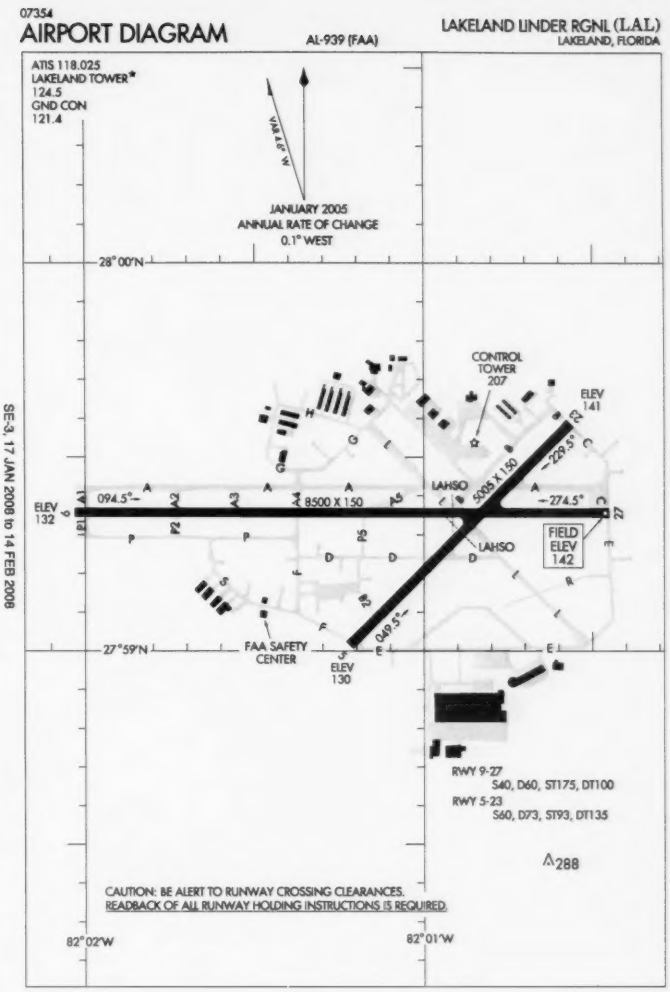
Stay on the Straight and Narrow Path

Keep the nose wheel on the straight and narrow path, otherwise known as the taxiway centerline. Under most circumstances, this practice will keep your airplane well clear of hazards on the ramp, but don't let your guard down! Airplanes are not always parked where they should be. Maneuver away from the centerline, if that is what is required to avoid hitting something. In any kind of congested area, taxi slowly and be vigilant. STOP immediately if there is even the slightest doubt in your mind.

Remember that rushing can be the quickest and surest way to waste time. Consider the following scenario: A pilot in a hurry is a little too optimistic about the distance between his wingtip and the chain link fence just a few inches away. He is already behind schedule for an important meeting. The rationalization goes something like this: "I know it looks really close, but I don't think I'll hit it, and I can't afford to lose any more time!"

Just one moment of really bad judgment is all it takes—and then "crunnnch." This pilot crumpled the wingtip and surgically removed the strobe and nav lights. Because he wouldn't take the time to avoid the incident, he was forced to take the time to deal with its aftermath. Moral of the story: When clearance is too close to call, don't let your ego get in the way. Call the FBO and request the assistance of a lineman or marshaller to guide you through the minefield. Then trust, but verify, in accordance with your responsibility as PIC on the ground.

Airport diagrams like this one for Lakeland Linder Regional Airport are available on the FAA Internet Web site for select airports and some airport diagrams are included in the FAA Airport/Facility Directory *books to help pilots navigate to and from runways.*



Staying on the centerline also requires being aware of surface conditions. If snow or ice is present, consider wind direction and velocity, and adjust the use of the flight controls and power, as appropriate to the specific condition. If the winds are blowing from behind, less power will be required. The opposite will be true with a headwind. If the ramp is too slippery, get help and have the airplane repositioned to drier ground before attempting engine start.

One final note on this topic: Another way to stay on the proverbial "straight and narrow path" and to stay out of the accident reports is to adopt a personal code of conduct and commit to follow it at all times. In aviation, the most important decisions you make are often the ones that you make long before you drive to the airport.

Avoid Sudden Stops

Whatever you do, never taxi any faster than your airplane can stop using normal brake application. Under certain circumstances, you might not have the time or distance to stop. Also, a sudden or "panic" stop that requires quick brake application can cause the airplane to lunge forward with a lot of force, compressing the nose wheel strut and bringing the prop closer to the pavement. In some cases, depending upon the surface conditions, this lunge can cause the prop to strike the pavement and damage the propeller, engine, and possibly the airframe. Propeller blades that come into contact with the ground for even one single rotation can turn the prop into a pretzel. Such events will require engine disassembly and inspection.

Remember that the steering and braking capability of most light general aviation airplanes is quite limited. The nose-wheel travel is restricted to only so many degrees of travel left and right of center, and this only improves slightly through the use of differential braking. Be conservative with throttle settings, and use just enough power to move the airplane at a safe taxi speed. A good rule of thumb: If you are riding the brakes, you are using too much power and moving too fast. Use brakes only when you need them, and avoid jockeying the throttle.

Taxi to the Runway

When you exit the ramp, things can get a whole lot busier, especially during peak traffic periods at larger airports. I cannot overemphasize the importance of looking out the window. As you proceed down the centerline, look ahead, to the left, and to the right in a constant scan. Other tips:

1. Observe signage and know the meaning of each sign.
2. Verbalize that the taxiways ahead of you are clear of traffic. Speaking aloud reinforces the habit of visually clearing each intersection as you approach it.
3. Anticipate next steps. For example, if you see an airplane about to cross in front of you, you can expect to hear the controller instruct you to give way, or ask the other pilot to hold for you.
4. Speak up. It's better to feel a little foolish on the radio than to commit a foolish (and avoidable) mistake.
5. Know the rules. As outlined in the *Aeronautical Information Manual* (AIM)

4-3-18, a taxi clearance will permit your airplane (in the absence of hold-short instructions) to taxi to an assigned takeoff runway and to cross all intersecting taxiways and runways with the exception of the departure runway itself. Request progressive taxi instructions if you are confused. Controllers would prefer to provide this service than to have a lost airplane wandering around the field.

Understand the Pilot-Controller Relationship

Last, but not least, there needs to be a strong and cooperative relationship between air traffic controllers and pilots. Since we all have the same goal of safely moving airplanes on the surface of the airport, all of the individual parts of this jigsaw puzzle have to come together. While it's true that pilots don't always get every piece of the traffic puzzle, our friendly air traffic colleagues do have the bigger picture in mind. These highly skilled and trained professionals provide excellent service, but you must always remember that they are only human. Both pilots and controllers are vulnerable to making mistakes.

If you receive an air traffic instruction or clearance that doesn't seem quite right, speak up. Never forget that the system works, not because it is "controlled" by air traffic, but because pilots and controllers work together every day to that end. Air traffic controllers can make order out of chaos by putting the puzzle together and sequencing airplanes, but ultimately it is the responsibility of the pilot to ensure the safe conduct of the flight.

As PIC, whether in the air or on the ground, you have the responsibility and the authority to accept a clearance, when it is consistent with safety, and to refuse that clearance or request an amended clearance, if you believe it is not. If there is ever any doubt that your clearance to taxi or any other air traffic clearance compromises safety, decline it and negotiate an alternative that works for those on both sides of the microphone. A strong and cooperative partnership between pilots and air traffic is a significant step toward reducing the probability of a runway incursion.

Hangar Flying

Finally, learn from others. Use down time and ground time to ask other experienced pilots how they manage their time and organize their cockpits. We can all learn from each other. We need only ask—and then listen.

Be safe!

Jeff Sponberg is a part time flight instructor (CFI / CFII) at Horizon Aviation in Warwick, Rhode Island, and flies as a professional pilot during the week. This article is adapted with permission from a piece published on the Horizon Aviation Web site in November 2007.

James Williams Photo

All pilots need to be alert when taxiing out for takeoff and landing to make sure they don't have a runway incursion.

JAMES WILLIAMS

The Cheapest Insurance

Reasons for an Instrument Rating

For many pilots of light aircraft, there are few times when you can absolutely say, "My instrument rating was necessary for this flight." Most of the instrument flying we do is in clear blue skies. In my own experience, when I lived in Florida, we rarely had good low instrument conditions that were not accompanied by thunderstorms. If there is a thunderstorm, I'm not going anywhere. So the question is: Does the average light general aviation (GA) aircraft pilot even need an instrument rating?

The answer is an emphatic *yes*. While the regulations do not require an instrument rating for strictly Visual Flight Rules (VFR) operation, there's a good reason to have one anyway: It's the cheapest insurance you can get. Even if you don't plan to fly in bad weather regularly, or at all, it's a smart investment. We have a tendency to think of insurance as something to pay for damages, if something goes wrong. We think of it as a small amount we pay regularly to avoid having to pay a large amount should unfortunate events occur.

Another way to think about it, though, is to think of insurance as an exercise in risk reduction. Risk reduction involves two main factors: the *probability* of an event's occurrence, and the *severity* (i.e., the cost or negative effect) if the event does occur. In the case of auto insurance, you are reducing the severity of the risk, by covering yourself against the damage or loss you would incur in case of an accident. You might think of this practice as *reactive* safety: It reduces the damage or cost of an unfavorable event but, like the airbag in your car, it does nothing to reduce the probability of an accident.

You have other means to reduce the probability of an occurrence, which is *proactive* safety. Proactive safety deals with reducing the risk of having an accident at all. In a car, the stability or traction control system helps keep you from losing control and having an accident. Note, though, that while this device reduces probability of occurrence, it does little (if anything) to reduce severity (i.e., by reducing damage if an accident does occur).

Let's apply this thinking to the aviation example. Think of an instrument rating as a proactive means of risk reduction. It won't make hitting the ground any more survivable, but it can dramatically reduce the chances of hitting the ground in the first place. The best testament to this fact is the number of aircraft accidents that occur when non-instrument-rated pilots encounter poor weather or dark night

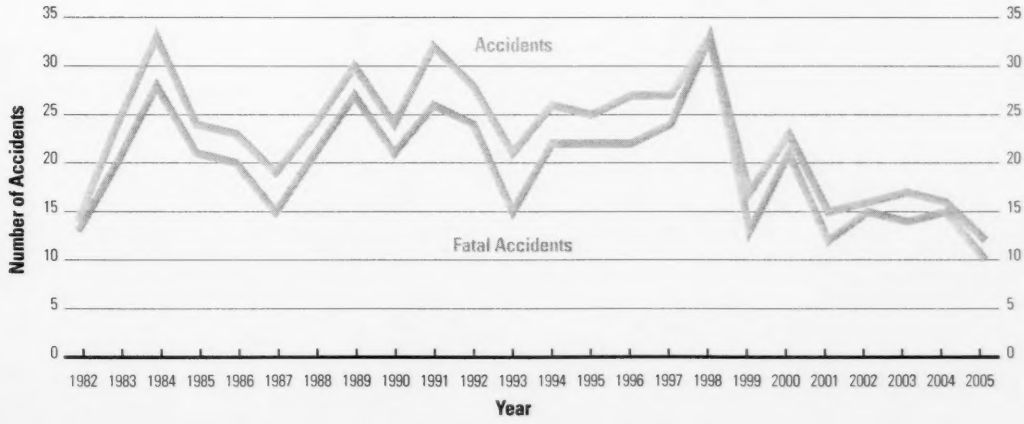


Figure 1: The Number of Non-Instrument Rated Pilot Weather Encounter Accidents – 1982-2005, the top line depicts total accidents and the bottom line fatal accidents. Source: NTSB

conditions. A review of National Transportation Safety Board records from 1982 to 2005 shows 550 total accidents for non-instrument-rated pilot weather encounters, 474 of which were fatal. That is a more than 86 percent ratio of fatal accidents to total accidents. For the period studied, there were 970 fatalities, 66 serious injures, and 49 minor injuries. These numbers further highlight the overwhelmingly fatal nature of these events.

Figure 1 shows the number of accidents over the period reviewed. As you can see, since 2000, the number of accidents has generally declined. The reports suggest that this might be caused by a reduction in the number of pilots without instrument ratings who were filing and flying under Instrument Flight Rules (IFR). These occurrences, although not completely eradicated, have been dramatically reduced in recent years. Still, the number of accidents each year accounts for about one per month. The data show an average of nearly 23 accidents per year and nearly 20 fatal accidents per year for the 24 year period. While this decline is a positive step, it remains to be seen whether this is simply a fluctuation of the data or a meaningful decline.

In terms of deaths and injuries resulting from these accidents, Figure 2 shows the breakdown by year. While numbers for the last five years have generally declined to about 30 fatalities per year, with 2005 providing a low of 18, it also remains to be seen whether this will be a continuing trend. The average for the 24-year period is still 40 fatalities per year.

To simplify, I classified these accidents into three basic types of weather conditions: Instrument Meteorological Conditions (IMC), Marginal Visual Flight Rules (MVFR), and dark night conditions. IMC means instrument conditions, as stated in the report. For conditions that were better than IMC, but not clear VFR weather, I designated the accident to have occurred in MVFR. In many cases, the reports specifically stated MVFR conditions. Many MVFR accidents occurred during hours of darkness. Few accidents were designated as dark night accidents, because in most cases they fit in the other two designations more appropriately. So unless the report stated it was dark night conditions and VFR weather, these accidents were classified as one of the other categories.

As you might expect, the vast majority of accidents occurred in IMC. This trend was probably reinforced by the fact that the causal statement often designated VFR flight into IMC, thus making the weather condition determination. Also these determinations are not totally concrete. In many cases it was both a dark night and IMC, but as stated earlier these would be cataloged under the IMC category. Figure 3 shows the breakdown of accident conditions.

The accidents fell into three broad categories: Loss of Control (LOC) accidents, Controlled Flight into Terrain (CFIT) accidents, and obstacle accidents. In some cases, determinations had to be made as to what category an accident belonged, this mainly applied to the distinction between CFIT and LOC accidents. The attitude of the aircraft at impact

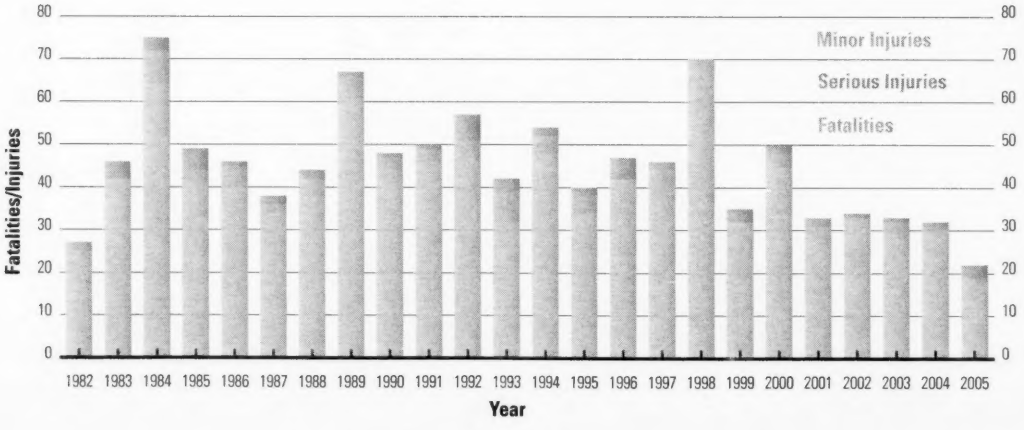


Figure 2: Fatalities/Injures from Non-Instrument Rated Pilot Weather Encounters 1982-2005. Source: NTSB

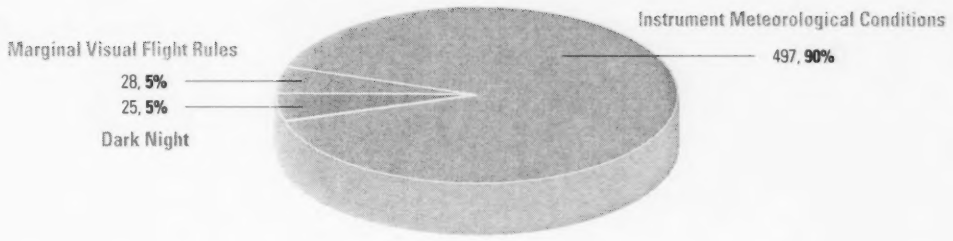


Figure 3: Weather Conditions of Accidents for Non-Instrument Rated Pilots -1982-2005. The number of accidents for each category is listed on the chart. Source: NTSB

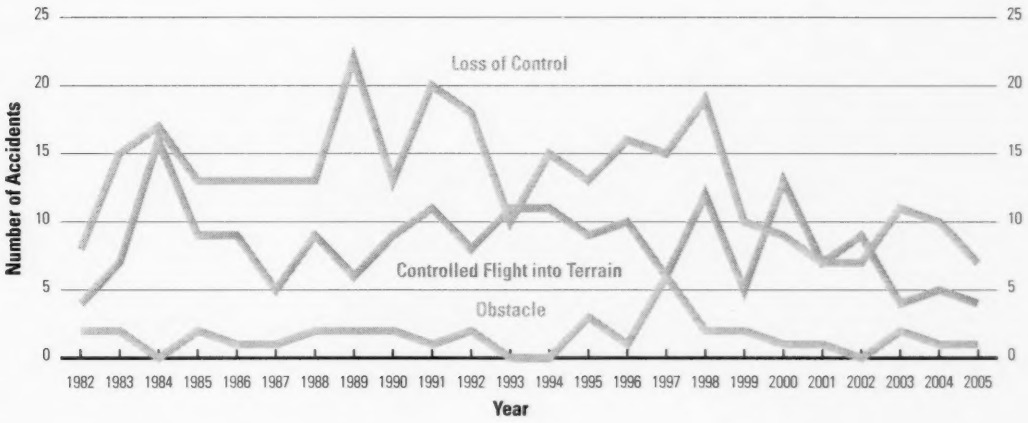


Figure 4: Type of Accident 1982-2005. Source: NTSB

was usually the determining fact. A steep angle of impact usually indicated a LOC, while a shallow angle was more characteristic of a CFIT accident. Figure 4 shows the breakdown of the type of accidents over the period reviewed.

Overall Loss of Control accounted for 57 percent of total accidents, CFIT 36 percent, and obstacle impacts 7 percent. As Figure 4 shows, there are several brief periods when the number of CFIT accidents exceeded the number of LOC accidents, but LOC is clearly the main issue. LOC accidents are usually caused by spatial disorientation. CFIT accidents are usually caused by loss of situational awareness.

All of this information indicates that an encounter with adverse weather or lighting conditions by a non-instrument-rated pilot has a very good chance of producing an unpleasant ending for all involved.

Does the instrument rating totally prevent a weather accident? No, it does not. But it does decrease the probability of an accident for one of the reasons discussed above. As stated at the beginning of this article, it is a proactive method of risk reduction. The additional training provides a pilot with improved skills in aircraft control, upset recovery, instrument scan, and much more. It's one of the best insurance policies you can get to reduce your chances of being involved in certain kinds of aircraft accidents.

In a future issue, we will discuss the requirements and ways to get your instrument rating. This will include discussing Title 14 Code of Federal Regulations part 61, Certification: Pilots, Flight Instructors, and Ground Instructors, versus part 141, Pilot Schools, and looking at the FAA/Industry Training Standards (FITS) approach.

James Williams is a Technical Writer-Editor in Flight Standards Service's General Aviation and Commercial Division. He is also a pilot and a ground instructor.

FROM THE WAAS PROGRAM OFFICE, AIR TRAFFIC ORGANIZATION

WAAS Bigger, Better, Lower, and More

Last year, the Wide Area Augmentation System (WAAS) improved its coverage, availability, and the approach minimum altitudes it supports to help achieve full operational capability status in 2008. Additionally, the FAA published more RNAV (GPS) procedures with WAAS minima. Today, pilots have access to 1,000-plus space-based, Instrument Landing System (ILS)-like approaches, 313 of which are located at non-ILS airports. This bigger and better area coverage was improved through three efforts: New WAAS satellites, new wide-area reference stations (WRS), and new software versions that accompanied the implementation of the new hardware.

On July 11, 2007, WAAS discontinued the use of the existing satellites that broadcast the WAAS correction signal. Higher powered and better located, the new Telesat and Intelsat Galaxy XV satellites provide WAAS users with significantly improved WAAS availability, especially in the Northeast portion of the country. On September 28, 2007, WAAS coverage was expanded further into Canada and Mexico by the integration of nine new international WRS into the WAAS network. In addition to extending WAAS coverage to users throughout large portions of Canada and Mexico, this expansion also benefits WAAS users within the United States. Areas formerly on the fringe of WAAS coverage, especially portions of Alaska, are now well within its coverage boundaries.

Lower minima were approved in April, when the FAA authorized WAAS Localizer Performance with Vertical Guidance (LPV) descent minima from 250-foot decision altitudes down to 200 feet. More approaches are now available to pilots. The FAA published 308 new RNAV (GPS) with LPV minima in 2007. Now, 569 of the 1,000-plus LPV procedures published-to-date are to runways without an ILS. Since WAAS allows pilots to fly LNAV/VNAV minima as well, there are actually more than 1,400 approaches with vertical guidance available to the aviator. This June, there will be more runways served by WAAS LPV than by ILS, and the difference will continue to grow. The FAA Flight Plan goals are to publish 300 RNAV (GPS) LPV procedures in fiscal year 2008 and then 500 per year starting in 2009.

Today, satellite-based procedures represent about 42 percent of the approximately 10,500 instrument approach procedures maintained by the FAA. As the agency continues to publish new RNAV (GPS) procedures, while decommissioning little-used ground-based procedures, such as nondirectional beacons (NDB), that percentage will steadily increase.

The FAA Flight Standards Service believes that having 3-D ILS-like approaches to altitudes as low as 200 feet is a tremendous benefit. Using LPV, the FAA can put 3-D ILS-like approaches into airports without having to add or maintain ground-based components, such as localizer or glide slope transmitters. When compared with an ILS, $1 million is saved each time an LPV approach is installed, and these savings continue through the avoidance of maintaining a ground-based aid to navigation (navaid). WAAS and LPV are helping to improve aviation safety by providing approaches with vertical guidance at hundreds of runway ends at a cost that is incredibly low when compared to its predecessor system.

WAAS Web sites

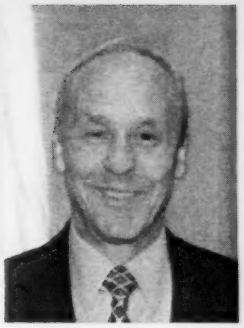
To see the actual WAAS coverage, click the "Real Time WAAS Coverage Link" found at the bottom of http://gps.faa.gov or access this page directly at http://www.nstb.tc.faa.gov/RT_VerticalProtectionLevel.htm.

To search for RNAV (GPS) and other types of instrument procedures, use the FAA search tool at: http://avnweb.jccbi.gov/schedule/production.

For more information, see the FAA's Satellite Navigation Web site at: gps.faa.gov.

Aeromedical Advisory

FREDERICK E. TILTON, M.D.
FAA FEDERAL AIR SURGEON



Help Us Help You

Medical certification is a subject near and dear to the heart of every pilot, as it has been since Dr. Louis Bauer developed the first set of physical standards for civilian pilots in 1927. If you saw the movie "Pearl Harbor," in which the Ben Affleck character (an aspiring pilot trainee) sweated bullets in anticipation of his qualifying medical exam, you may have felt pangs of recognition and empathy. In fact, you may well be among those who still sweat bullets every time your pilot medical certificate is due for renewal. If so, this column is for you.

Our goal for this column, which debuts in this issue as a regular department in the FAA Aviation News, *is to demystify the people, the policies, and the procedures of the FAA Office of Aerospace Medicine, and to provide an authoritative source of medical news that you can use. In keeping with those goals, we will devote the space in this inaugural article to a brief overview of what we do, and what you can do to help us give you the best, and most efficient, service we can possibly provide.*

Purpose of Medical Certification

Just as in Dr. Bauer's day, the goal of aerospace medicine is to enhance aviation safety by ensuring that pilots are medically fit to fly aircraft. The idea, of course, is to eliminate medical factors as a cause of aircraft accidents.

Our Customers

In a word—YOU. We serve all airmen requiring a medical to operate general aviation and commercial aircraft in the United States.

Our Services

The Office of Aerospace Medicine has a number of responsibilities to our customers and to the flying public. These include:

- Establishing and ensuring medical standards and certification procedures for pilots
- Designating and training physicians to serve as Aviation Medical Examiners (AMEs) for the FAA
- Issuing pilot medical certificates
- Reviewing medical records for the purpose of issuing authorization for Special Issuance
- Issuing duplicate medical certificates
- Verifying pilot medical certificates

To give you a sense of the volume of work generated by these responsibilities, consider these numbers. In a typical calendar year, the FAA:

- Receives more than 435,000 airman exams
- Processes more than 30,000 special case exams
- Electronically processes 90 percent of airman exams received
- Receives more than 175,000 telephone and written airman inquiries
- Generates more than 75,000 individual letters to airmen

Our Commitment To You

The Office of Aerospace Medicine aims to provide the best and most efficient service we can offer. To this end, we have established the following service goals:

- Your pilot medical certificate will be issued to you in your AME's office on the day you complete your medical examination, unless you have medical problems that require further review.
- If your certificate cannot be issued by your AME, because further medical review is required, your paperwork will be forwarded to the FAA. We will process your application for

medical certification within an average of 30 working days of receipt of all necessary medical information from your medical provider(s).

What You Can Do

More than 90 percent of medical certification applicants pass their physical examinations and the Aviation Medical Examiner (AME) is able to issue a medical certificate at the time of the exam. Occasionally, however, a condition is found that requires further review and, possibly, additional testing. Although it is impossible to generalize or to predict the likelihood of certification for any specific individual, our current guidelines, procedures, and processes allow us ultimately to certify 96 percent of the individuals whose medical qualifications are initially questioned at the AME level.

We receive an average of 1,800 applications for medical certification each day.

In many cases, the primary requirement is a set period of recovery from an illness, surgery, or other condition. In other cases, it is necessary that we review and evaluate a great deal of information. A few numbers help tell the story: We receive an average of 1,800 applications for medical certification each day. Regulations require us to review each one in order to ensure that medical standards are met. If we find that an application does not meet the requirements, we send the pilot a letter to identify the problem and outline options and potential courses of action. Once the pilot responds, we must review the entire application package again.

Given the large number of applications being processed and the amount of time required to evaluate new information—especially in a complex case—it sometimes takes longer than we all would like. There are, however, several things you can do to speed the process along.

DO send us everything we request. We ask only for what we need to make a decision on your application, and that means that we really do need everything that we request.

DO make sure that your AME or treating physician performs any test or procedure we request, just as we have requested it. Please understand that if we ask that a certain test be performed in a certain way, then that is what we need. Take all of our letters to your physician, and try to emphasize the importance of exactly fulfilling our requests.

DO send everything related to your application—all requested information and documentation—to us in one package.

DO include all medical facts. Leaving out information may delay the evaluation of your application while we investigate the second problem.

DO ask your AME for advice and assistance in gathering the requested information. Your AME should be your guide and advocate in this process.

Working Together

The Office of Aerospace Medicine is here to work for you, and with you, to make your medical certification process go as quickly and as smoothly as your individual circumstances permit. We look forward to "meeting" some of our customers in this regular column, and invite your suggestions for topics you'd like to see covered in this space.

For more information on medical certification, see: www.faa.gov/pilots/medical/.

Until next time, good health and safe flying!

During a 26-year career with the U.S. Air Force, Dr. Tilton logged over 4,000 hours as a command pilot and senior flight surgeon flying a wide variety of aircraft, including the T-33, T-37, F-15, T-38, RB-57F, C-12, C-141 and B-47. He currently flies the Cessna Citation 560 XL. A graduate of the U.S. Military Academy, Dr. Tilton received both M.S. and M.D. degrees from the University of New Mexico and an M.P.H. from the University of Texas. He is board-certified by the American Board of Preventive Medicine in both Aerospace and Occupational Medicine. He is a Fellow of the Aerospace Medical Association and the American College of Preventive Medicine.

A BRIEF HISTORY OF AVIATION MEDICINE

The "father" of civil aviation medicine is Dr. Louis Hopewell Bauer, whose lifelong love affair with aviation began when he witnessed the first airplane flight in his hometown of Boston. He served in the U.S. Army Medical Corps, which included service in an aviation unit in San Antonio, Texas, and eventually became director of its Medical Research Laboratory in 1919. In this capacity, he established the first School for Flight Surgeons—the School of Aviation Medicine—in 1922. He published a textbook called *Aviation Medicine* in 1926 and served in a variety of official and unofficial aviation-related roles. In May 1926, Dr. Bauer left the Army Air Service—shortly after implementation of the Air Commerce Act—to become the first director of the Medical Service in the Aeronautics Branch of the Department of Commerce.

In this capacity, Dr. Bauer developed the first physical standards for civilian pilots. After a series of public hearings directed by William P. MacCracken, who was Assistant Secretary of Commerce for Aeronautics, the standards took effect in January 1927 as Section 66 of the Air Commerce Regulations. The new regulations required a physical examination (cost not to exceed $5) and established three levels of physical qualification:

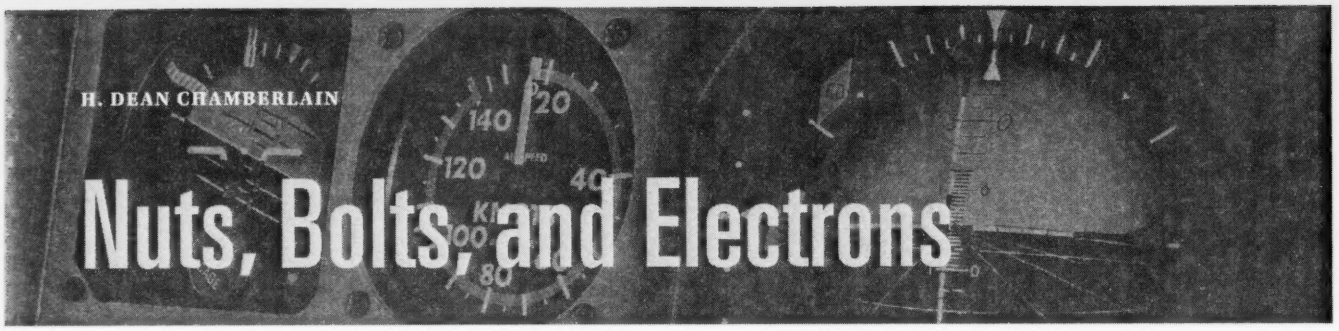
1. Private Pilots: Absence of organic disease or defect which would interfere with safe handling of an airplane under the conditions for private flying; visual acuity of at least 20/40 in each eye (less than 20/40 may be accepted if the pilot wears a correction in his goggles and has normal judgment of distance without correction); good judgment of distance; no diplopia in any position; normal visual fields and color vision; no organic disease of eye or internal ear. (Note: Student pilots were subsequently included in this category for medical certification purposes.)

2. Industrial Pilots: Absence of organic disease or defect which would interfere with safe handling of an airplane under the conditions for private flying; visual acuity of not less than 20/30 in each eye, although in certain circumstances less than 20/30 may be accepted if the applicant wears correction to 20/20 in his goggles and has good judgment of distance without correction; good judgment of distance; no diplopia in any position; normal visual fields and color vision; absence of organic disease of eye, ear, nose, or throat.

3. Transport Pilots: Good past history, sound pulmonary, cardio-vascular, gastro-intestinal, central nervous, and genito-urinary systems; freedom from material structural defects or limitations; freedom from disease of the ductless glands; normal central, peripheral, and color vision; normal judgment of distance; only slight defects of ocular muscle balance; freedom from ocular disease; absence of obstruction or diseased conditions of the ear, nose, and throat; and no abnormalities of the equilibrium that would interfere with flying.

Dr. Bauer's classification scheme also provided for waivers, as follows: In the case of trained, experienced flyers, the Secretary of Commerce may grant waivers for physical defects designated as disqualifying by these regulations when in his opinion the experience of the pilot will compensate for the defect. A waiver once granted will hold indefinitely so long as the defect for which it was granted has not increased or unless cancelled by the Secretary of Commerce.

We've come a long way.



H. DEAN CHAMBERLAIN

Nuts, Bolts, and Electrons

Are You Legal?

How about you? Are you legal? If your answer is, "Sure I am," then what about your aircraft? You may be legal as a pilot, but does your aircraft meet that requirement as well? Most pilots are familiar with the need for flight reviews, number of takeoff and landings required for currency to be pilot in command (PIC) and carry passengers, and what is required to maintain instrument currency. But, how many pilots know what constitutes a "legal" aircraft, and understand exactly what that means?

Consider this case. The Howard 500 is a fully pressurized twin-engine aircraft with a stand-up cabin, since it was designed to be a long-range executive airplane. Powered by Pratt &Whitney R-2800 18-cylinder, two-row water-injected 2,500 horse-powered engines, the airplane burned 200 gallons per hour with a range of about 2,200 miles. The aircraft has a fuel capacity of 1,546 gallons.

The Type Certificate Data Sheet (TCDS) No. A1SW, awarded to the Dee Howard Company, lists four engine types approved for the airplane. The TCDS also lists the approved fuel for those engines. As noted on the TCDS, 115/145 minimum grade aviation gasoline is the appropriate fuel to feed those engines.

Now the question: Where in today's world can you find 115/145 minimum grade of gasoline? Many airports sell 100 low lead (LL) and Jet A. So what do you do if you are flying into an airport with just these two choices? It's probably a safe bet that most pilots would refuel with 100LL. They would have fuel, but are they legal?

There is no simple "yes" or "no" answer. First, look at the TCDS for any approved alternate fuel(s). Finding none, start looking elsewhere. The next logical step is to search for a supplemental type certificate, or STC. An STC is issued under Subpart E of Title 14 of the Code of Federal Regulations part 21. section 21.113 states, in part, that: *"Any person who alters a product by introducing a major change in type design, not great enough to require a new application for a type certificate under section 21.19, shall apply to the Administrator for a supplemental type certificate...."*

Does anyone hold a STC for using 100LL in this aircraft and its engines? If you determine that someone holds such a STC, then the aircraft owner seeking to use 100LL in the aircraft must contact the STC holder for permission to use the STC. The owner of the STC would then have to provide written authorization to the requestor. Since 100LL is a different type of fuel, the STC holder would have had to show that using the fuel would not damage the engines or the fuel system. Also, the STC holder probably would have had to recalculate the performance data for the aircraft using the new fuel.

Fuel is just one example of possible conflicts between an aircraft's TCDS and the actual aircraft. Other examples include engines, propellers, and other items not listed on the TCDS. This situation is especially true of older aircraft when parts availability, modifications, and repairs are not done in accordance with FAA procedures. Although the item or modification may not jeopardize flight safety, the aircraft is not airworthy, and not "legal," if it has not been done with the proper approval process, such as using a field approval or STC.

What does this mean for you as pilot in command? It means that you need to make sure that your aircraft meets its TCDS. If it does not, was the change or modification done properly? A review of the aircraft's records should provide a history of installed items or changes in the TCDS inventory that document what was changed or installed with the proper reference. To find TCDS information, go to www.faa.gov, click on the "Mechanics" link, and follow the additional links to the TCDS part of the site. The site provides guidance on how to find the TCDS for your particular type of aircraft.

Check it out. You will undoubtedly learn something, and the life you save could be your own!

H. Dean Chamberlain is an Aviation Safety Analyst in Flight Standards Service's General Aviation and Commercial Division. He is a Commercial Single and Multiengine Land and Sea rated pilot, a Commercial Glider pilot, a Certificated Flight Instructor Airplane Single and Multiengine and Instrument, and an aircraft owner.

FEDERAL AVIATION ADMINISTRATION

A1SW
Revision 3
HOWARD
500

July 17, 1967

TYPE CERTIFICATE DATA SHEET NO. A1SW

This data sheet which is a part of type certificate No. A1SW prescribes conditions and limitations under which the product for which the certificate was issued meets the airworthiness requirements of the Civil Air Regulations.

Type Certificate Holder — The Dee Howard Company
International Airport
San Antonio, Texas

I - Model 500 (Transport Category), Approved February 20, 1963

Engine — 2 Pratt and Whitney Double Wasp CB17 or
R-2800-52WD or R-2800-83AM7D or
R-2800-103WD Engines
Carburetor Setting No. 391433-17

Fuel — 115/145 minimum grade aviation gasoline
Water/Methanol Mixture Ratio 50/50

Engine limits

	HP.	R.P.M.	M.P. in Hg.	Alt. (Ft.)
Takeoff Wet (2 min.)	2500	2800	62.0	S.L.
	2500	2800	61.5	3700
Maximum Continuous Power				
Low Blower (7.29 to 1)	1900	2600	51.5	S.L.
	1900	2600	50.0	7200
High Blower (8.58 to 1)	1750	2600	51.5	10,000
	1750	2600	49.5	15,000

Propeller and propeller limits — 2 Hamilton Standard 24E60-41 hubs with four 7037A-50S blades each.
Diameter: Maximum 10' 11-7/8", Minimum 10' 9-1/4".
No further reduction permitted.
Settings at 42 inch station:
Low Pitch 33°
Feathered 88°
Avoid Ground Operation 1950-2250 r.p.m.
Avoid In-flight Operation 1900-2175 r.p.m.

Airspeed limits (CAS) — Vne (Never exceed) 1
Vc (Max. structural c
Mne (Never exceed n
Mmo (Normal operat
Va (Maneuvering)
Vfe (Flaps down 14°)
Vfe (Flaps down 35°)
Vlo (Landing gear op
Vle (Landing gear ext
Vll (Landing light ext

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This excerpt from the Howard Type Certificate Data Sheet shows the minimum type of fuel approved for the airplane.

Need Documents on Your Aircraft?

The FAA's Aircraft Registration Branch maintains registration records on individual aircraft and serves as a repository for airworthiness documents received from FAA field offices. To obtain copies of records for a specific aircraft, you can mail or fax the request, or make the request online at www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/copies_aircraft_records/.

For a small fee, the FAA provides either paper copies or electronic copies (on CD-ROM).

DANIEL ROLLER, *EDITOR, AVIATION MAINTENANCE ALERTS*

Aviation Maintenance Alerts

Piper: PA32RT; Engine Mount Corrosion; ATA 7120

The following discrepancy and safety discussion is provided by FAA Aerospace Engineer Barry Ballenger. Contact information is at the article's end.

The following defect description is an example of what can result when an inadequate inspection is performed during an annual or 100-hour inspection. The aircraft is a 1978 Piper PA-32RT-300T *Lance* with a total time of around 3,600 hours. It was brought to a maintenance facility for an oil change and an engine discrepancy: "Failure to develop take-off RPM." A recent annual inspection had been accomplished.

While accessing the engine compartment to perform maintenance, corrosion damage to the engine mount was noted. Further investigation revealed extensive corrosion damage to both the engine mount and the galvanized metal firewall. The damage was hidden by the upholstery covering on the baggage side of the fire wall and the insulation blanket on the engine side. Additionally, this portion of the firewall is difficult to inspect due to the turbocharger installation.

The corrosion damage was due to leaking turbocharger and exhaust system components. This aircraft's engine installation is very compact with little isolation distance between the turbo/exhaust systems and the firewall/engine mount structure. Close proximity allows the heat generated by the turbo and exhaust systems to impact the firewall. At significant expense and downtime, this aircraft was repaired by replacing several engine mount tubes, the firewall, and associated engine compartment ducting.

This maintenance facility recommends insulation blankets and upholstery (that may cover damaged firewalls) should be removed during annual or 100-hour inspections. All turbo and exhaust systems should be closely inspected for signs of leakage and heat damage.

For further information contact Barry Ballenger, FAA, Continued Operational Safety Branch, 901 Locust, Room 301, Kansas City, MO, 64106-2641; 816-329-4152; barry.ballenger@faa.gov.
Part Total Time: 3,600.0 hours.

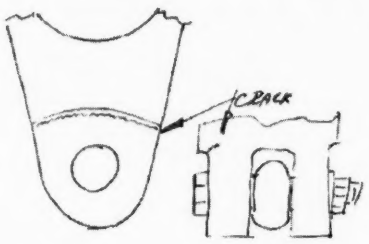
Piper: PA28-161; Corroded Main Gear Attach Bolt; ATA 3211

A mechanic states, "While washing the aircraft, the scrub brush knocked off the nut...for one of the AN4-11A bolts securing the right main landing gear assembly *(P/N 35644-05)* to the right wing. The bolt was corroded all the way across its cross section. "*(I)* suggest: 1) periodically check torque on these bolts to ensure the bolt is not corroded through like this one; and 2) replace these bolts periodically to preclude corrosion failure."

Part Total Time: 8,236.1 hours.

Beech: 65-B80; Cracked Elevator Bell Crank Support Arm; ATA 2730

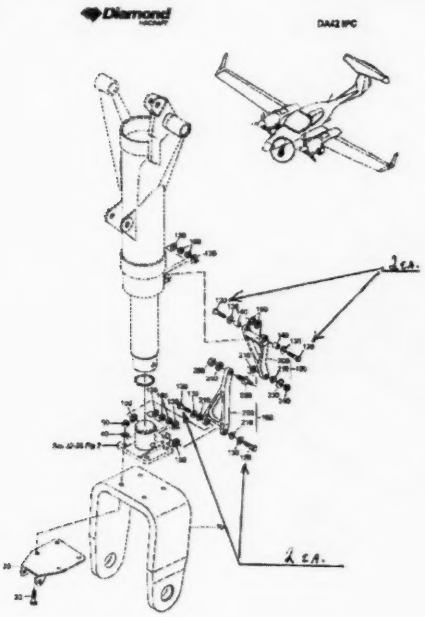
A mechanic for an air taxi operator states, "A crack was found on the R/H bell crank support arm assembly *(P/N 50-524414)* during a mandatory five-year inspection (Service Bulletin 2231, Revision 1)."



Thanks! Those are two nice hand drawings showing precisely where to inspect —Alerts *Editor*
Part Total Time: (unknown).

Diamond: DA42;
Bent Nose Gear Torque Link Bolts; ATA 3222

A technician for a flight training school submitted a worn and bent nose landing gear torque link attach bolt (P/N LN9037-M5 x 22). He said, "The nose landing gear torque links were removed to facilitate other maintenance. The four bolts used to secure the torque links were found to be bent and joggled; presumably, from sheer loads."



There are no additional records of this defect in the SDRs data base. Given that this relatively new light twin is used in a training environment, one might reasonably be concerned these bolts are of insufficient strength and/or size for their loads. Similar aircraft should be inspected for bolt deformation—and the torque links for corresponding damage. A cohort inspector at a different training school relates his company has also purchased multiple, new models of this aircraft. He is well positioned to observe new manifestations of this specific defect and promises to keep the Alerts *posted as their student-flown aircraft are..."broken in."* —Alerts *Editor*
Part Total Time: 616.0 hours.

Aviat: A-1;
Uncoupled Elevator Pushrod; ATA 2730

The submitting mechanic stated, "...a pilot reported total loss of elevator control on final approach to Blairstown airport. The boot around the rear control stick was removed—*(we)* found the elevator push rod was no longer connected. The aft belly ban was removed and a loose bolt and washer were found. The nut was not found. The other rod ends were *(also)* inspected for safety; the self-locking nut and bolt for the aft interconnect push rod was very loose. This existing hardware was not reinstalled because it was *(found)* loose *(during)* this inspection. *(New hardware was installed for each noted discrepancy, replacing the old with)* AN bolts, washers, nuts, and cotter pins in the rear control stick rod-end connection points. After inspection and repair of the flight controls, the aircraft was deemed airworthy. The owner was advised to have a factory Aviat service center inspect the aircraft and make repairs according to the maintenance manual and parts book.

The probable cause for the loose hardware could be from the reuse of the hardware or incorrect torque applied to the nuts and bolts. (A castle nut and cotter pin were installed in place of self-locking nuts...a proven method of safety for flight controls.)

No part numbers accompanied this discrepancy.
Part Total Time: (unknown).

Beech: B60;
Corroded Flight Control Cables; ATA 2730

A mechanic says, "During an annual inspection (I) found several control cables that were corroded due to *(their)* being submerged in water (and later exposed to evaporation of that same water) which had collected in the belly of the aircraft. These control cables will be removed and replaced, the water dried up, and possible leak areas inspected and corrected as needed. *(I)* also found control cable pulleys seized: the L/H elevator pulleys aft of the aft spar, the aileron pulleys forward of the forward spar, and the elevator pulleys in the tail-cone. These pulleys will be removed and replaced."

No part numbers accompanied this discrepancy. The Service Difficulty Reporting System (SDRS) data base includes one description of a B60's flap motor and electrical wire submerged in water.
Part Total Time: (unknown).

Beech: 65-A90-1;
Broken Elevator Bell Crank Fork; ATA 2730

A technician for an air-operator writes, "(I) found a broken fork on the elevator bell crank support arm at the forward end of the elevator L/H

pushrod. The pushrod forward attach bolt had been over-torqued so much as to create a 0.016 - 0.021 inch depression in each (magnesium) fork—where they pressed into the rod end bearing. Raytheon's Service Bulletin SB2231r2 includes: 1) inspection for cracks in this area of the elevator bell crank, 2) inspection for proper gap between the rod end and support arm forks (0.00 to 0.01 inch gap), and 3) proper torque of the pushrod attach bolt (70 to 108 inch pounds).

"I recommend following the proper inspection, installation, and torque *(procedures)* when installing the bell crank and pushrods. Follow the instructions in the maintenance manual and SB2231r2."

Bell crank assembly P/N 50-524401.
Part Total Time: (unknown).

Lycoming: O-360A4M; Cylinder Separation; ATA 8530

A mechanic states, "The pilot experienced a noticeable pop sound in the engine compartment, followed by roughness. The engine oil pressure started to deteriorate and the pilot elected to shut down the engine, stopping the propeller from turning by putting the aircraft *(Cessna 172N)* in a nose high attitude. He managed to glide to a major airport and successfully dead-stick landed without accident. Investigation showed the number one cylinder head had separated from the barrel ... This cylinder was replaced 206 hours earlier, when the engine was overhauled. The cylinder was purchased new from ECI in San Antonio, Texas. The popular name is Titan Cerminil *(P/N AEL 65102)*. A new Titan cylinder was installed. The engine ran normally with no adverse problems noted. The separation of the cylinder is thought to be *(caused by)* stress cracking due to threads cut in the cylinder head having little or no radius in the valley of the threads—thereby setting up stress risers. Separation tear marks belie earlier cracking that eventually led to total fracture of the head assembly."

Aircraft engine maintenance book from World War II

The SDRS data base provides 341 records for the 8530 JASC code, 10 of which specify cylinder separation.
Part Total Time: 206.0 hours.

Lycoming: O-320-D36; Leaking Carburetor Float; ATA 7322

"On shutdown *(this aircraft's engine)* RPM increased 400 RPM," writes an unidentified submitter. "At idle the engine would *(run)* at 600 RPM, drop to 300 RPM, then die. Upon opening the carburetor *(I found)* one half of the white plastic float was 80 per cent full of fuel—it did not leak out over night."

Precision Airmotive carburetor, P/N LW 15986-85; float P/N 30-804. The SDRS data base reports at least four fuel-laden carburetor floats.
Part Total Time: (unknown).

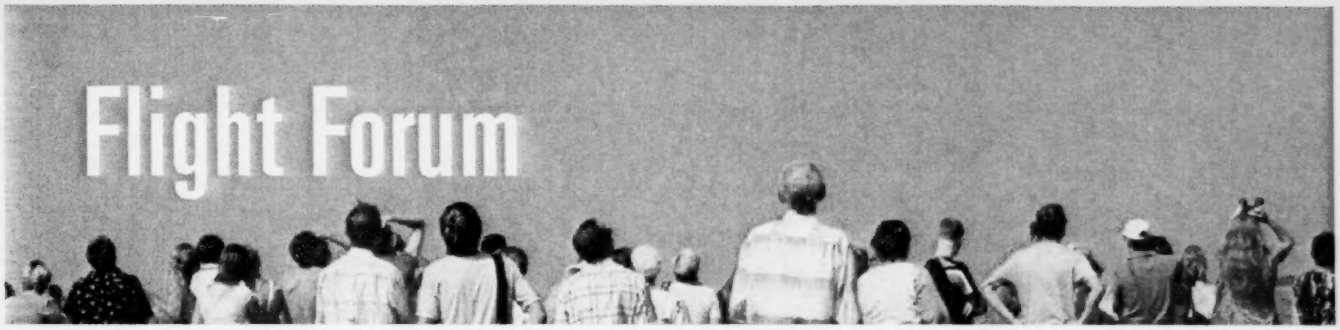
Lycoming: O-360-J2A; Broken Rocker Arm; ATA 8530

A mechanic working a Robinson R22 Beta II provided a short description and two photographs of this engine's defect. "The number four cylinder intake rocker arm cracked and split into two pieces *(P/N 17F19357)*. The probable cause *(for its failure)* is aggressive machining of the rocker arm and/or the rocker arm incorrectly contacting the keeper spring assembly.

Part time since overhaul: 4.9 hours.
Part Total Time: (unknown).

The Aviation Maintenance Alerts *provide a common communication channel through which the aviation community can economically exchange service experience, and cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those who operate and maintain civil aeronautical products, and can be found on the Web at http://www.faa.gov/aircraft/safety/alerts/aviation_maintenance/. The monthly contents include items that have been reported as significant, but have not been evaluated fully by the time the material went to press. As additional facts, such as cause and corrective action, are identified, the data will be published in subsequent issues of the* Alerts. *This procedure gives* Alerts' *readers prompt notice of conditions reported via a Malfunction or Defect Report (M or D) or a Service Difficulty Report (SDR). Your comments and suggestions for improvement are always welcome. Send them to: FAA; ATTN: Aviation Data Systems Branch (AFS-620); P.O. Box 25082; Oklahoma City, OK 73125-5029, or e-mail to the* Maintenance Alerts Editor *at daniel.roller@faa.gov.*

Flight Forum



Thunderstorms and TAF

I've heard that a National Weather Service (NWS) forecaster cannot include thunderstorms in a terminal forecast (TAF) for the first nine hours of the forecast valid time, unless there is a 50 percent chance or greater of thunderstorms occurring. Is this true?

—Name withheld
Via the Internet

You are correct, but not only for thunderstorms, also for any precipitation. A pilot has to be aware of other indicators of thunderstorms, such as thunderstorms being forecast in the area forecast and updates from the Automated Flight Service Station (AFSS) regarding a look at weather radar along the flight path. Air Traffic Control will also describe areas of precipitation. Forecasters may indicate that thunderstorms will be in the vicinity of the airport (VCTS), even when there is less than a 50 percent chance of them. Pilots should be aware of this and not let their guard down when their destination forecast does not include thunderstorms.

For example, a 70 percent probability of precipitation for showers is forecast for a zone in the afternoon. At a TAF site in that zone, a 30 percent chance of showers is forecast for early afternoon and a 70 percent chance for late afternoon. The corresponding TAF would not include the 30 percent probability of precipitation in the first nine hours, and then may include showers in the prevailing group as the probability increases later in the day.

Just a Suggestion

May I congratulate your staff on doing a great job in *FAA Aviation News*.

This being your 47th year of publication, looks like you may have covered all safety levels, but we both know that is incorrect! With the technology changing faster than MACH 1, keeping up all general aviation safety is a tight schedule and mandatory effort.

This is just a note regarding your request for suggestions, is it possible in the margin of the Flight Standards Information Management System (FSIMS) to include the new WINGS program information as a "How to enroll, quick and easy!!!"

We have information on WINGS listed in www.faasafety.gov, but the more hype we can get the easier the new WINGS program will be received. I am a retired airline pilot and used to that type of training schedule, but the average general aviation flyer is not. We need all the press we can get.

—Captain Dick Norman
FAASTeam member

Thanks for your suggestions; we have forwarded them to the FSIMS staff. As for publicizing the new WINGS program, we expect to publish an article on it later this year.

AIM URL Correction

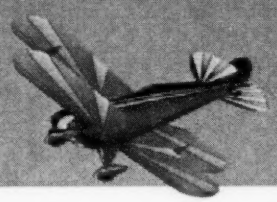
In the January/February issue, the "Know Your NOTAMs" article had an error on page 12. The second paragraph in the "Sources and Resources" section has a sentence break that put a hyphen in the *Aeronautical Information Manual* URL that shouldn't be there.

The correct URL is: http://nfdc.faa.gov/airnews/index.html/.

—FAA, Aeronautical Information Services

FAA Aviation News *welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to Editor,* FAA Aviation News, *AFS-805, 800 Independence Avenue, SW, Washington, DC 20591, or FAX them to (202) 267-9463, or e-mail them to AviationNews@faa.gov.*

JAMES WILLIAMS



AV News

NEW ICAO English Language Endorsement

The International Civil Aviation Organization (ICAO) is requiring that all persons who hold a Private, Commercial, or Airline Transport Pilot certificate/license with an airplane or helicopter rating have a language proficiency endorsement on their pilot certificate by March 5, 2008. This requirement applies only to international operations. No other pilot certificates are affected. Flight Engineer, Flight Navigator, and Control Tower Operator certificates are also required to have the language proficiency endorsement.

Though all U.S. certificate applicants are required to meet the English language eligibility requirements of Title 14 Code of Federal Regulations (CFR) parts 61, 63, and 65, the regulations do not require U.S. certificate holders to have a language proficiency endorsement on their certificates. However, to satisfy the ICAO language proficiency endorsement requirements, the FAA will provide, upon request, a replacement certificate to any certificate holder affected by the ICAO requirements with the additional endorsement, "English Proficient." U.S. certificate holders operating aircraft outside of the United States may be required to have this endorsement when acting as required crew on or after March 5, 2008.

In order to obtain a U.S. replacement certificate with the "English Proficient" endorsement, a certificate holder may submit a request to the FAA through the FAA Web site at www.faa.gov/licenses_certificates/airmen_certification/ or by mail to Federal Aviation Administration, Airmen Certification Branch, AFS-760, P.O. Box 25082, Oklahoma City, OK 73125-0082. The request must include the following information: name, date, and place of birth, Social Security number, and/or certificate number, and the reason you are requesting a replacement certificate. The cost to the airman is $2.00. If mailing the request, please submit a check or money order in U.S. funds for the amount.

All new U.S. certificates issued after February 8, 2008, affected by the ICAO requirement will be issued with the "English Proficient" endorsement.

Age 65 Rule Becomes Law

On December 14, 2007, the retirement age for Title 14 Code of Federal Regulations (14 CFR) part 121 air carrier pilots was extended to 65, when President Bush signed the Fair Treatment for Experienced Pilots Act (HR 4343). "The FAA welcomes the legislation," the agency said in a prepared statement. "The determined efforts of Congress have averted a lengthy Federal rulemaking process, while enabling some of our nation's most experienced pilots to keep flying."

The law differs from the International Civil Aviation Organization's (ICAO) September 2006 policy change in that there is no requirement that one of the pilots in the cockpit is younger than 60 years of age. International flights will have to comply with the ICAO requirement. For more information, visit http://www.faa.gov/news/updates/age%5Frule/.

Final Rule On Damage Tolerance Data

The FAA issued its final rule on Damage Tolerance Data for Repairs and Alterations, which became effective on January 11, 2008. This final rule requires holders of design approvals to make available to operators damage tolerance data for repairs and alterations to fatigue critical airplane structure. This rule supports operator compliance with the Aging Airplane Safety final rule with respect to the requirement to incorporate into the maintenance program a means for addressing the adverse effects repairs and alterations may have on fatigue critical structure. For more information, visit http://edocket.access.gpo.gov/2007/07-6016.htm.

Nationality And Registration Marks On Non-Fixed-Wing Aircraft

On September 14, 2007, the FAA confirmed its direct final rule on nationality and registration marks on non-fixed-wing aircraft. Now effective, the rule allows operators of U.S.-registered powered parachutes and weight-shift-control aircraft to display their nationality and registration marks in other than a horizontal orientation on the fuse-

lage, a structural member, or a component of the aircraft. The direct final rule also clarifies the size requirement for nationality and registration marks on these aircraft. For more information, see www.faa.gov/regulations_policies/rulemaking/recently_published/.

FAA Extends Comment Period For ADS-B NPRM

The FAA first issued its notice of proposed rulemaking (NPRM) regarding Automatic Dependent Surveillance-Broadcast (ADS-B) on October 5, 2007, with a scheduled closing of the comment period on January 3, 2008. In response to requests for more time from many industry groups, the FAA extended the comment period to March 3, 2008. For more information, see the November 19, 2007, *Federal Register,* page 64966-64968.

FAA Approves UPS Advanced ADS-B Operations

The FAA approved the use of Automatic Dependant Surveillance- Broadcast (ADS-B) technology by UPS at Louisville International Airport. UPS will use advanced ADS-B operations at its hub at Standiford Field for merging and spacing during approaches. This will be the first use of satellite guided merging and spacing in the United States. The ADS-B technology will allow UPS pilots to see other company aircraft in the air and on the ground via a cockpit display of traffic information (CDTI). These advances will allow UPS to reduce noise, emissions, and fuel consumption though use of Continuous Descent Arrival (CDA) procedures. CDA procedures allow aircraft to maintain near idle power from the beginning of the descent from cruise by tightly sequencing the aircraft and minimizing vectors.

ADS-B is a key component of the Next Generation Air Transportation System (NextGen). For more information on other uses of ADS-B, see the article on "ADS-B in the Gulf of Mexico," in our January/February 2008 issue (page 15), available online at: http://www.faa.gov/news/aviation_news/2008/media/janfeb2008.pdf.

Changes To FAA Rulemaking Procedures

In the December 28, 2007, *Federal Register*, the Department of Transportation (DOT) announced a change to the general rulemaking procedures for FAA. The change reinstates Title 14 Code of Federal Regulations section 11.71, which covers what information must be included in petitions for rulemaking. For more information, visit http://a257.g.akamaitech.net/7/257/2422/01jan20071800/edocket.access.gpo.gov/2007/07-55525.htm.

Another change the public should be aware of is the new headquarters location for the Department of Transportation. The DOT has moved into a new building, so any comments on proposed rulemaking should be sent to following address: Docket Operations, M–30, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, West Building Ground Floor, Room W12–140, Washington, DC 20590. Remember to indicate the Docket Number on your comments.

Commercial Aviation Alternative Fuels Initiative Fact Sheet

The Commercial Aviation Alternative Fuels Initiative (CAAFI) was established in 2006 to enhance energy security and environmental sustainability for aviation by exploring the potential use of alternative fuels. CAAFI provides a forum for the U.S. commercial aviation community to engage the emerging alternative fuels industry and to work together, share and collect needed data, and motivate and direct research on aviation alternative fuels.

An updated fact sheet was released on January 3, which covers the background, goals, and desired accomplishments of the CAAFI. The CAAFI meets annually to update the state of alternative fuel developments in these areas, identify gaps and hurdles, and decide on next steps required in the research, development and deployment process. For more information please visit: http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=10112.

CAST Launches New Air Safety Web Site

The Commercial Aviation Safety Team (CAST) is expanding its outreach efforts by launching a new Web site to spread information about efforts to make commercial air travel safer. The new Web site, www.CAST-safety.org, is geared toward the international aviation community, interested media, government agencies, and the general public. The Web site details CAST safety enhancements, procedures, and the global strategy that has resulted in the CAST track record of increasing safety and reducing commercial aviation accidents.

When CAST was formed in 1998, its goal was to reduce the fatal accident rate by 80 percent over 10 years. In 2007, CAST was able to report that by implementing the most promising safety enhancements, the fatality risk of commercial air travel in the United States was reduced by 83 percent. Using aviation industry data, CAST is identifying emerging threats before they result in accidents. CAST is also continuing to spread its methods internationally and has been the model for establishing similar safety programs for general aviation and rotorcraft.

H. DEAN CHAMBERLAIN

Editor's Runway

Are You Ready for the New Flying Season?

We call this our annual Sun 'n Fun™ issue because we use this magazine to promote the event and to support the FAA mission at Sun 'n Fun in Lakeland, Florida. Yet, the FAA can only do so much towards safety.

The FAA develops rules, sets standards, and operates the National Airspace System, but safety starts and ends with all of us involved in aviation. Whether you are a pilot, a maintenance technician, air traffic controller, a fuel-truck driver, an aeronautical engineer, or someone building an experimental aircraft, your safety and the safety of those for whom you are responsible rests in your hands. Your skill, knowledge, and integrity all play a role.

In many respects, aviation flies on trust.

Aviation is a dynamic industry, so improving your skills through continuing education and training is critical. If you have not flown much recently, now is the time to think about scheduling some refresher training with your favorite flight instructor. A flight review is a good overall refresher, but if you like a challenge, consider upgrading your pilot certificate, or adding an additional category or class rating. The knowledge requirements and flight training will get you back into flying and improve your overall knowledge and flight skills.

You may wonder why integrity is part of this equation. The answer is simple. You may have the knowledge and skill to do a task, but do you have the integrity to always follow the rules and prescribed procedures for that task. This is as true for a pilot flying an instrument procedure, as it is for someone building or repairing an aircraft. In many cases, such as flying in marginal weather or working on an aircraft, only the person involved may ever know whether the proper procedure was followed. Much of the work, especially in maintenance, cannot be seen. As a matter of trust, pilots accept work that they cannot directly see has been done correctly. The rules require it, but personal integrity ensures it. In many respects, aviation flies on trust.

If you maintain aircraft, continuing education is always important. You may know how to work with the new composite aircraft, but do you know how to work with fabric? What about the new light sport aircraft—do you know how to maintain them? What about working on the new "glass cockpit aircraft?" The challenges are there. Are you prepared for them?

Regardless of how you participate in aviation, you can certainly benefit from attending special aviation events. Whether you are into parachuting, gliders, seaplanes, engines, specific types of airplanes, light sport aircraft, ultralight vehicles, rotorcraft, or ballooning, to name a few, there are organizations, conventions, fly-ins, meetings, and training seminars throughout the year to help you improve your knowledge and skills. The FAA Safety Team (FAASTeam) provides online training and educational resources through its Internet home page at www.faasafety.gov/. You can also search this Web site by your zipcode to find training events in your local area.

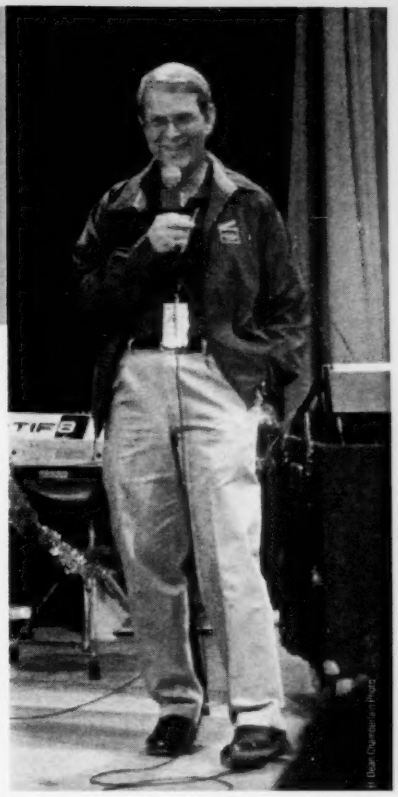
To find out more about training opportunities, check out one of the many aviation magazines and Internet Web sites for a calendar of events. The following are a few of the many annual events:

- Light Sport Expo in Sebring, Florida in January
- Soaring Society of America™ convention in February
- Sun 'n Fun Fly-In in Lakeland, Florida in April
- Experimental Aircraft Association (EAA) annual AirVenture™ Convention and Fly-In each year in Oshkosh, Wisconsin in late July
- Aircraft Owners and Pilots Association convention in November this year
- Professional Aviation Maintenance Association (PAMA)

These events all offer opportunities to meet and talk with subject matter experts, attend training seminars, and in some cases, meet industry experts. The opportunity is there. You only have to take it. Are you ready for the new flying season?

H. DEAN CHAMBERLAIN

FAA Faces



Obie Young enjoys a moment talking to the audience during one of his many presentations.

Obie Young: Safety Advocate and Teambuilder

His resume is impressive: national award winning flight instructor, Airline Transport Pilot with more than 16,000 hours, corporate pilot, former air show performer and air show producer, former FAA designated pilot examiner, public speaker, aviation safety columnist, FAA Aviation Safety Inspector and Safety Program Manager at the North Florida Flight Standards District Office (FSDO), and now the National FAA Safety Team (FAASTeam) Production Manager at the FAA Safety Center and Production Studio in Lakeland, Florida. These are only some of the many accomplishments of Obie Young. But this unassuming man will tell you nothing is done without the help of others.

To understand how much Young has accomplished, travel back to the original FAA Safety Center at Lakeland Linder Regional Airport. It is one of two such FAA centers; the other one is at Wittman Regional Airport in Oshkosh, Wisconsin. The center was constructed to take the FAA support at the annual Sun 'n Fun Fly-in at Lakeland out from under a tent and move it into a permanent facility. The steel-framed metal building was designed to provide space for FAA exhibits, pilot weather briefings, and airman support offered by a temporary FSDO staff during the Fly-In. Part of the building included an area for safety presentations by FAA and industry experts. It was functional, but not elaborate.

> "Most people want to do the right thing, but they need to be asked. Some folks call this 'the fine art of asking.'"

When asked how he became involved with the FAA and the FAA Safety Center, Young said, "When I joined the Safety Program, my boss asked me to establish communications with industry and aviation organizations to improve aviation safety. We developed the Lakeland facility as a 'working' studio so that you and the audience could be part of a video presentation produced, directed, and recorded for wide distribution to promote accident-free aircraft operation. Additionally, as a 'training academy,' FAA personnel and volunteers learn hands-on."

Through the work of hundreds of dedicated volunteers, support from the National Aviation Safety Foundation and the State of Florida, as well as the dedication and leadership of Young, what was once a bare-bones Spartan-like facility has emerged into the FAASTeam's National Production Center. This did not happen overnight. The Center's success is the result of the hard work and support of dedicated volunteers. Over the years, volunteers trained themselves, found surplus audio and video equipment, and then upgraded that equipment as conditions permitted. The Center is now used year round to promote aviation safety for numerous regional and national aviation events and is now available throughout the United States and several other countries via satellite feeds and over the Internet.

When asked about his volunteers, Young said: "Most people want to do the right thing, but they need to be asked. Some folks call this 'the fine art of asking.' But remember they need a task that is not overwhelming and has specific time constraints." When working with volunteers, he said, "The secret is to help people help in the areas that they enjoy most. This may take time to get to know them and time to help them learn to improve their skills in specific areas."

Like a conductor leading a well-trained symphony orchestra, the volunteers' professionalism and dedication, some might say their fanatical support of the Center, is a reflection of the high standards Young sets for the Center. His vision and leadership provide the foundation for what has become the FAA's premier safety production center.

See http://www.faaproductionstudios.com/ for more information on the FAA Safety Center and Production Studio.

U.S. Department
of Transportation

**Federal Aviation
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The Federal Aviation Administration Wants You!

Attention pilots, mechanics, and avionics technicians:

This is your chance to start a career in the exciting field of federal aviation safety. The FAA's Flight Standards Service is currently hiring aviation safety inspectors. We are looking for individuals with strong aviation backgrounds for inspector positions in fields ranging from Maintenance to Operations, to Avionics. Both air carrier and general aviation inspectors are needed in all fields. There are positions available through out the nation. This is your opportunity to use your experience to improve the already excellent safety record of civil aviation in the United States. As an aviation safety inspector you would be responsible for overseeing airmen, operators, and others to ensure they meet the rigorous safety standards set forth by the FAA.

The FAA is an excepted service agency of the United States Department of Transportation. Starting salaries range from $39,795 to $75,025 (FG 9- FG 12) plus locality pay (Locality pay is a geographical enhancement to your base salary). For more information please visit http://www.opm.gov/. Benefits include federal retirement and 401K type accounts. Health and other insurances are also available. This is an excellent opportunity for those who want to be involved in federal aviation safety.

Qualifications vary depending on discipline. For details please visit http://jobs.faa.gov/. Under "All Opportunities" you can search by job series 1825 or title containing "inspector." The FAA is expecting to hire approximately 850 inspectors this fiscal year so start your application today.